BEFORE THE ARIZONA CORPORATION COMMISSION

JEFF HATCH-MILLER
    Chairman
WILLIAM A. MUNDELL
    Commissioner
MARC SPITZER
    Commissioner
MIKE GLEASON
    Commissioner
KRISTIN K. MAYES
    Commissioner

AVIS READ; individually, and on Behalf of All Others Similarly Situated,)
 	
                    Complainants,)
 	
v.)
)
ARIZONA PUBLIC SERVICE COMPANY,)
                Respondent.)
_____)
	DOCKET NO. E-01345A-04-0657

IN THE MATTER OF THE APPLICATION OF) ARIZONA PUBLIC SERVICE COMPANY FOR) A DECLARATORY ORDER REGARDING BILL) ESTIMATION PROCEDURES) _____)	DOCKET NO. E-01345A-03-0775

DIRECT

TESTIMONY

OF

PERRY L. WHEATON

CO-PRESIDENT

BARRINGTON-WELLESLEY GROUP, INC.

JANUARY 24, 2005

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EXECUTIVE SUMMARY
ARIZONA PUBLIC SERVICE COMPANY
DOCKET NOS. E-01345A-04-0657 & E-01345A-03-0775

6   The Utilities Division Staff (Staff) of the Arizona Corporation Commission (ACC or

7   Commission) retained the Barrington-Wellesley Group, Inc. (BWG) to perform an inquiry into

8   the usage estimation, meter reading, and billing practices of Arizona Public Service Company

9   (APS or Company). On December 28, 2004, the initial report related to this inquiry was filed

10 with the Commission.

11 The purpose of this testimony is to provide the results of work completed since the issuance of the

12 December 28, 2004 report. The results of our additional work have not changed the conclusions

13 and recommendations included in our initial report. In this testimony, we present additional

14 findings and recommendations. The key additional recommendations are as follows.

15 • The Commission should require APS to refund overestimated demand charges totaling at least

16     $171,686 plus interest.

17 • The Commission should require APS to change its current methodology for estimating

18   demand to one using customer-specific, prior month kW to estimate demand.

19 • The Commission should require APS to commence an internal audit of its compliance with

20   Commission rules and Commission-approved tariffs within three months of the close of this

21   proceeding and complete the audit, with a copy of the audit report to be filed with the

22   Commission, within twelve months of the close of this proceeding.

23 This testimony also provides additional support for some of the recommendations set forth in the

24 December 28, 2004 report. A complete summary of Staff recommendations related to the inquiry

25 into the usage estimation, meter reading, and billing practices of APS, including the

26 recommendations contained in Staff's report dated December 28, 2004, is provided in Section

27 Nine of this testimony.

INTRODUCTION

1

2 **Q.** **Please state your name, occupation, and business address.**

3 A. My name is Perry L. Wheaton. I am the Co-President and Co-Founder of the Barrington-

4 Wellesley Group, Inc. BWG is a general management consulting firm which performs a

5 significant portion of its work in the electricity, gas, and telephone industries. My

6 business address is P.O. Box 2390, New London, New Hampshire 03257.

7

8 **Q.** **Please describe your educational background and professional experience.**

9 A. I have over thirty years of diversified management consulting and auditing experience and

10 have performed financial, operations, and/or affiliate interest reviews for over twenty-five

11 utilities. I have directed twenty-five management reviews of public utilities for state

12 regulatory commissions. In my twelve years as an auditor and consultant with Coopers

13 and Lybrand, I had extensive experience in the financial and systems operations of

14 utilities, financial services companies, energy services companies, and manufacturers. I

15 have an AB from Hamilton College and an MBA in public accounting from Rutgers

16 University. My complete resume is included as Schedule PLW-1.

17

18 **Q.** **What is the scope of your testimony in this case?**

19 A. I am the BWG engagement director for the inquiry into the usage estimation, meter

20 reading, and billing practices of APS on behalf of the Staff.

21 Our initial report was filed on December 28, 2004. This testimony presents findings,

22 conclusions, and recommendations based on work completed since the initial report was

23 prepared. This testimony also provides additional explanations and support for some of

24 the recommendations set forth in the December 28, 2004 Report.

25

SUMMARY OF TESTIMONY AND RECOMMENDATIONS

Q. **Briefly summarize the organization of your testimony.**

A. My testimony is organized into nine sections as described below.

1. Section One discusses the results of our analyses related to demand estimating methodologies. In addition, this section contains our response to David Rumolo's testimony regarding demand estimation, which was provided in his November 23, 2004 testimony. Schedule PLW-2 presents the results of the analyses completed.

2. Section Two discusses APS' kWh estimation practices; specifically, we discuss whether those practices are biased toward the overestimation of kWh usage.

3. Section Three discusses the quantification of the unadjusted overbilling of demand and our recommendation related to crediting customers' accounts.

4. Section Four discusses the information provided by other Arizona electric utilities in response to Staff's second set of data requests dated January 3, 2005.

5. Section Five presents supplemental information received from other state utility regulatory agencies.

6. Section Six presents the results of our additional review of the Company's meter reading practices, including our discussion with the meter reader assigned to read the meter at Ms. Read's Paradise Valley premises during 1999 and 2000, the results of our discussions with meter reading personnel, and the review of meter reading reports at APS' Flagstaff and Surprise offices.

7. Section Seven discusses the revenue requirement impact of APS' usage estimation methodology, which tends to underestimate demand.

8. Section Eight lists all recommendations resulting from the Staff inquiry into the usage estimation, meter reading, and billing practices of APS.

9. Section Nine presents additional, miscellaneous information.

Q. **Has BWG proposed any additional recommendations contained in this testimony that resulted from work completed after the issuance of Staff's December 28, 2004 Report?**

A. Yes, BWG has five additional recommendations.

    1. APS should be required to change the methodology that it uses to estimate demand from one using class average load factors to one using customer-specific, prior month kW. The use of customer specific demand history results in more accurate demand estimates.

    2. APS should be required to refund to customers the overbilled demand charges plus interest that occurred from September 1998 with the implementation of the new CIS through September 2003 when changes were made to the Company's CIS to correct this problem. There were 9,056 residential customers who were overbilled based upon inaccurate demand estimation, and the overbilling was not subsequently credited to the customer's account. The amount of the overbilling which should be credited to the appropriate residential customers' accounts totals $171,686. APS is still compiling similar data for general service customers. Staff will update this testimony once it receives that information. APS' calculation of these refunds will be subject to verification as part of the independent audit recommended by Staff. In general, based on our analyses, we recognize that APS' demand estimating methodology more often resulted in underbilled demand than overbilled demand during this period.

    3. BWG has four recommendations related to meter reading.

        a. APS should be required to develop and install performance measures to document the efforts that it has taken to comply with the Commission requirement that "(a)fter the second consecutive month of estimating the

customer's bill for reasons other than severe weather, the utility will attempt to secure an accurate reading of the meter." (R14-2-210. A. 3.).

    b.   APS should specifically include the use of EZ-Read as one of the steps taken to resolve a "no access" situation.

    c.   APS should utilize available DB Microware reports to review lock-outs by route to monitor trends in lock-outs and reduce the number of "no access" meters.

    d.   APS should establish an internal process whereby after three consecutive estimates, continued instances of consecutive estimates due to "no access" situations are reported and made visible to increasing levels of APS management.

4. APS should perform an analysis to determine whether the inclusion of May as a summer season month for purposes of estimating kWh is appropriate. This analysis should be filed with the Commission within 90 days of the conclusion of this matter. In reviewing the detailed analyses supporting Mr. Rumolo's November 23, 2004 Testimony, we noticed that estimated kWh consumption is generally higher than the actual kWh consumption in the month of May. May is the first month of the summer season; therefore, CIS estimates consumption billed in May using the summer seasonal average. Due to cycle billing, approximately one-half of consumption billed in May will represent energy used in April. This trend is reversed to some degree in the early winter season months.

5. APS should enhance its "no access" resolution process to include the sending of certified letters at the time it notifies customers that continued "no access" will result in the possible discontinuance of service.

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Q. **Did the visit to Avis Read's Paradise Valley premises, the interview of the meter reader assigned to Avis Read's property, and the interview with the meter reading supervisor change Staff's findings related to Company actions to obtain access to Ms. Read's meter?**

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A. No. If anything, it is now clearer that APS had reasonable remedies that it failed to implement to resolve the "no access" situation at Ms. Read's premises in Paradise Valley. For example, APS failed to contact Ms. Read to arrange for the replacement of the lock key that she had made available to the meter reader and failed to respond to Ms. Read's offer to allow APS to replace her lock with an APS lock. This is discussed in more detail in Section Seven of my testimony.

12

Q. **Do you have any additional recommendations?**

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A. Yes, we have two additional recommendations. First, APS should be required to commence an internal audit of its compliance with Commission rules and Commission-approved tariffs within three months of the close of this proceeding and complete the audit, with a copy of the audit report to be filed with the Commission, within twelve months of the close of this proceeding. APS completed a "CIS Compliance to ACC Rules and Regulations Audit" in August 2002; however, this audit failed to identify that APS was not estimating usage for residential demand in conformance with the tariff provisions for Rate Schedules EC-1 and ECT-1R.

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Second, APS should be required to provide documentation that lists the customers who were not issued three or more bills as a result of APS' CIS problems during late 1999 and early 2000. This documentation should also describe all the circumstances surrounding these customers' accounts so that the Commission may evaluate whether they were impacted in a manner similar to Avis Read. For example, this report should indicate whether APS offered customers extended payment terms once the backbill was issued,

1   describe what terms were offered, and discuss whether APS communicated with these

2   customers to make them aware of the billing problems.

3

4 Q. **What was the overall affect of APS' class average load factor estimating**

5   **methodology?**

6 A. In general, our analysis shows that customers receiving bills that contain estimated

7   demand charges have more often been underbilled demand than overbilled demand since

8   March 1999. The results of our analyses are discussed in more detail in the following

9   section of my testimony. APS' use of a class average load factor to estimate demand more

10   frequently underestimates demand than overestimates demand, and during the period from

11   March 1999 to August 2002, when APS added a "generosity factor" to the class average

12   load factor, this tendency towards underestimation was exacerbated.

13

14   **SECTION ONE: DEMAND ESTIMATION METHODOLOGIES**

15

16 Q. **Which alternative demand estimation methodologies were evaluated in forming your**

17   **recommendation related to demand estimation?**

18 A. We evaluated the following five demand estimating methodologies in forming our

19   recommendation related to demand estimation:

20   o Class average load factors

21   o Seasonal class average load factors

22   o Customer specific load factors

23   o Customer specific historical kW – prior month

24   o Customer specific historical kW – same month prior year

25

26 Q. **Please describe the class average load factor demand estimating methodology.**

A.   In March 1999, APS began using class average load factors to estimate demand for residential customers (rate schedules EC-1 and ECT-1R) and certain general service customers (rate schedule E-32). Class average load factors are used in conjunction with customer-specific kWh consumption to estimate demand using calculations described in detail in Chapter IV of the December 28, 2004 Report. "Load factor" represents the ratio of a customer's average hourly usage to the customer's peak hourly usage. APS calculated load factors for each of these three customer classes (EC-1 - residential, ECT-1R - residential time-of-use, and E-32 – general service under 3 MW). APS used metering information from Interval Data Recording (IDR) devices installed at 99 residential (EC-1) customer premises, 56 residential time-of-use (ECT-1R) customer premises, and 949 general service (E-32) customer premises to calculate the class average load factors.

Q.   **Please describe the seasonal class average load factor demand estimating methodology.**

A.   The seasonal class average load factor methodology is a variation of the class average load factor demand estimating methodology described above. Using information provided by APS, we determined the extent to which class average load factors for the winter and summer seasons varied from the annual class average load factor calculated by APS and applied the seasonal differences to the annual class average load factors currently being used. As expected, the summer class average load factors for residential customers were higher than the winter class average load factors. However, for general service customers, we calculated no variance in winter and summer seasonal class average load factors. As a result, we did not estimate demand using a seasonal class average load factor for general service customers billed under rate schedule E-32.

Q.   **Please describe the customer specific load factor demand estimating methodology.**

1   A.   The customer specific load factor demand estimating methodology was used by APS

2   when demand was estimated by the "old CIS" prior to September 1998. This

3   methodology uses customer specific information to calculate load factor when this

4   information is available. The "old CIS" calculated customer-specific load factors by

5   averaging the load factors from the two previous months and the same month of the prior

6   year. BWG used this same calculation to evaluate the customer specific load factor

7   demand estimation methodology.

8

9   **Q.**   **Please describe the customer specific historical kW (prior month) demand estimating**

10   **methodology.**

11   A.   The Commission-approved tariffs for rate schedules EC-1 and ECT-1R contain language

12   describing the "determination of kW capacity." The tariff language states that "in the

13   event the meter is inaccessible to the meter reader due to locked gates or because of safety

14   limitations, the kW shall be that measured since the last resetting of the kW dial." While

15   the use of the word "since" in this sentence is somewhat confusing, the language suggests

16   that APS should estimate demand using the last actual demand reading. We included this

17   methodology in our analysis to evaluate the accuracy of usage estimations performed

18   under the aforementioned Commission-approved tariff language.

19

20   **Q.**   **Please describe the customer specific historical kW (same month, prior year)**

21   **demand estimating methodology.**

22   A.   Rule R14-2-210 Billing and collection, Section A 2 states that "if the utility is unable to

23   read the meter on the scheduled meter read date, the utility will estimate the consumption

24   for the billing period giving consideration to the following factors where applicable:

25   a. The customer's usage during the same month of the previous year.

26   b. The amount of usage during the preceding month."

1   We included this methodology in our analysis to determine the effect of applying the

2   provisions of this rule to kW as well as kWh.

3

4   Q.   **Please describe in more detail the process used to analyze the five alternative demand**

5   **estimation methodologies.**

6   A.   To evaluate these alternative demand estimation methodologies, we selected a sample of

7   demand-billed customers from a listing prepared by APS in response to Staff DR 7-6.

8   From the population of all demand billed customers, we selected approximately every

9   400th customer to ensure a sample size of at least 300 accounts. The actual number of

10   customers included in the sample that we tested is as follows.

11

Rate Schedule	Number of Customers in Sample	Number of Individual Bills Tested – Class Average Load Factor	Required Sample Size to Achieve a 99 Percent Confidence Level – Assumed Mean of 2 kW	Required Sample Size to Achieve a 99 Percent Confidence Level – Using Calculated Mean of Sample
EC-1	54	1255	11	32
ECT-1R	140	2747	18	1226
E-32	193	3630	2453	3466

12   The increased sample size for rate schedule E-32 reflects the greater variability in usage

13   among customers in this rate class.

14   APS then provided twenty-four months' meter reading and billing history for the

15   customer, if available.

16   We developed calculations using an Excel spreadsheet to estimate demand using each of

17   the five methodologies described above. These estimates of demand were then compared

18   to the actual demand to determine the degree of accuracy of the demand estimation

19   methodology.

20

1 Q.   **Under which of these five methodologies are customers likely to receive the least**

2   **accurate estimate of demand?**

3 A.   As can be seen in the following tables, the use of class average load factors is the least

4   accurate method of estimating demand.   However, the results of our analysis appear to

5   support APS' assertion that the use of a class average load factor will result in the

6   underestimation of demand more often than the overestimation of demand.

7

8 Q.   **Under which of these five methodologies are customers likely to receive the most**

9   **accurate estimate of demand?**

10 A.   As can be seen in the following tables, the use of customer specific kW from the prior

11   month is the most accurate method of estimating demand. In addition, the use of the

12   customer specific kW from the previous month effectively addresses the issue of the

13   naturally occurring phenomenon of rising demand that occurs in the months approaching

14   summer as discussed in finding IV-8 in Staff's December 28, 2004 Report. The use of

15   other demand estimating techniques makes it less likely that overestimated demand will be

16   properly credited as a result of the next month's demand comparison.   The use of

17   customer-specific kW from the previous month to estimate demand also enhances the

18   likelihood that customer-specific demand history will be available on which to base the

19   demand estimate.

20

21 Q.   **How should demand be estimated if customer-specific history is not available?**

22 A.   If customer-specific kW from the previous month is used to estimate demand, the only

23   instances in which customer-specific history will not be available are when the bill is the

24   customer's initial bill or when the prior month's bill was estimated. For initial bills

25   covering a period of less than fifteen days, we believe that APS should not bill demand

26   until the actual demand reading is obtained in the following month. In this case, the

1   customer should be billed a pro rata amount for the initial billing period. For initial bills

2   covering a period of fifteen or more days, demand should be billed using actual premises

3   history from the prior month unless the Company knows that the general characteristics of

4   the previous customer's operations vary significantly from those of the current customer.

5   If the prior month's bill was estimated, APS should use the same month from the prior

6   year as the basis for the estimated demand reading. In the event this historical information

7   is not available, APS should consider its experience with other customers of the same

8   class in that area with the general characteristics of the customer's operations.

9

10   **Q.   Please summarize the results of these analyses.**

11   A.   The following tables present by rate schedule the differences between kW estimated using

12   each of the five methodologies described above and the actual kW demand readings.

13   These results are presented in more detail in Schedule PLW-2.

14

Rate EC-1 – kW Differences

Methodology	Class Average Load Factors	Seasonal Class Average Load Factors	Customer Specific Load Factors	Customer Specific kW – Prior Month	Customer Specific kW – Same Month Prior Year
Percent Within +/- 2 kW	55.7%	59.4%	75.4%	81.3%	77.2%
Percent Within +/- 4 kW	88.6%	92.0%	96.5%	95.9%	93.5%
Percent Within +/- 8 kW	99.3%	99.4%	99.8%	99.8%	99.5%
Percent Within +/- 16 kW	100.0%	100.0%	100.0%	100.0%	100.0%
Percent Within +/- 32 kW	100.0%	100.0%	100.0%	100.0%	100.0%
Percent Underestimated	66.7%	65.9%	51.5%	46.3%	53.8%
Percent – No Difference	1.6%	2.1%	0.2%	6.4%	3.8%
Percent Overestimated	31.7%	32.0%	48.3%	47.3%	42.4%

15

1

Rate ECT-1R – kW Differences

Methodology	Class Average Load Factors	Seasonal Class Average Load Factors	Customer Specific Load Factors	Customer Specific kW – Prior Month	Customer Specific kW – Same Month Prior Year
Percent Within +/- 2 kW	53.3%	63.1%	71.0%	73.7%	74.2%
Percent Within +/- 4 kW	84.6%	89.3%	92.1%	92.5%	93.4%
Percent Within +/- 8 kW	97.2%	98.3%	99.4%	99.0%	99.1%
Percent Within +/- 16 kW	99.7%	99.9%	99.8%	99.9%	99.9%
Percent Within +/- 32 kW	100.0%	100.0%	100.0%	100.0%	100.0%
Percent Underestimated	60.6%	60.7%	48.3%	48.2%	51.0%
Percent – No Difference	1.3%	2.0%	0.0%	3.8%	3.4%
Percent Overestimated	38.2%	37.3%	51.7%	48.0%	45.6%

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Rate E-32 – kW Differences

Methodology	Class Average Load Factors	Customer Specific Load Factors	Customer Specific kW – Prior Month	Customer Specific kW – Same Month Prior Year
Percent Within +/- 2 kW	33.0%	57.7%	73.4%	68.6%
Percent Within +/- 4 kW	51.2%	73.7%	82.7%	80.2%
Percent Within +/- 8 kW	73.5%	86.5%	90.3%	89.6%
Percent Within +/- 16 kW	88.0%	92.8%	95.1%	93.9%
Percent Within +/- 32 kW	93.3%	96.6%	97.9%	96.9%
Percent Underestimated	73.2%	51.8%	31.5%	40.5%
Percent – No Difference	6.8%	0.2%	37.6%	28.6%
Percent Overestimated	20.0%	48.0%	30.8%	30.9%

1   The following tables summarize by rate schedule the result of these analyses for estimated

2   dollar differences from the actual demand charges billed. These results are presented in

3   more detail in Schedule PLW-2.

Rate EC-1 – Dollar Differences

Methodology	Class Average Load Factors	Seasonal Class Average Load Factors	Customer Specific Load Factors	Customer Specific kW – Prior Month	Customer Specific kW – Same Month Prior Year
Percent Within +/- $10	35.1%	29.9%	51.8%	65.6%	60.3%
Percent Within +/- $20	64.7%	53.0%	83.4%	85.1%	81.6%
Percent Within +/- $40	93.8%	80.6%	97.4%	97.5%	95.3%
Percent Within +/- $80	99.4%	94.0%	99.8%	99.8%	99.5%
Percent Within +/- $160	100.0%	99.7%	100.0%	100.0%	100.0%
Percent Underestimated	66.7%	47.8%	51.5%	46.3%	53.6%
Percent – No Difference	1.6%	1.6%	0.2%	6.4%	3.8%
Percent Overestimated	31.7%	50.6%	48.3%	47.3%	42.4%

Rate ECT-1R – Dollar Differences

Methodology	Class Average Load Factors	Seasonal Class Average Load Factors	Customer Specific Load Factors	Customer Specific kW – Prior Month	Customer Specific kW – Same Month Prior Year
Percent Within +/- $10	28.9%	36.8%	46.8%	49.1%	48.5%
Percent Within +/- $20	54.9%	63.1%	71.8%	73.4%	75.3%
Percent Within +/- $40	84.6%	88.2%	92.0%	92.9%	92.2%
Percent Within +/- $80	97.0%	98.2%	99.5%	99.0%	99.0%
Percent Within +/- $160	99.6%	99.9%	99.9%	99.8%	100.0%
Percent Underestimated	60.6%	60.7%	48.3%	48.2%	51.0%
Percent – No Difference	1.3%	2.0%	0.0%	3.8%	3.4%
Percent Overestimated	38.2%	37.3%	51.7%	48.0%	45.6%

Rate E-32 – Dollar Differences

Methodology	Class Average Load Factors	Customer Specific Load Factors	Customer Specific kW – Prior Month	Customer Specific kW – Same Month Prior Year
Percent Within +/- $10	66.8%	83.1%	87.5%	85.8%
Percent Within +/- $20	84.1%	90.9%	93.1%	92.5%
Percent Within +/- $40	91.6%	95.4%	96.9%	96.0%
Percent Within +/- $80	95.8%	97.8%	98.7%	97.7%
Percent Within +/- $160	98.2%	99.1%	99.5%	99.1%
Percent Underestimated	56.4%	39.4%	27.4%	34.3%
Percent – No Difference	27.6%	21.6%	45.7%	39.5%
Percent Overestimated	16.0%	38.9%	26.9%	26.2%

Q. **Please explain why the Rate ECT-1R "kW Differences" table appears to indicate that Customer-Specific kW – Same Month Prior Year is more accurate than Customer Specific kW – Prior Month, while the Rate ECT-1R "Dollar Differences" table appears to indicate that Customer Specific kW – Prior Month is more accurate than Customer-Specific kW – Same Month Prior Year.**

A. I would first like to point out that the differences in the degree of accuracy between both customer-specific kW demand estimating methodologies are not significant for this rate schedule. In addition, the stratification of data selected to present the results of these analyses can result in minor differences. While a recommendation regarding which customer-specific kW demand estimating methodology may be "too close to call" for Rate ECT-1R, we believe the other advantages (see the answer to the second question on page 11 of this testimony) associated with the use of the customer-specific kW demand estimating methodology are sufficient to 'break the tie" and that there are advantages to having a consistent demand estimating methodology across rate schedules, such as employee training and customer communications.

1 **Q.   Did APS consider the use of customer specific historical kW to estimate demand**

2 **when selecting the use of class average load factors to estimate demand?**

3 A.   No.   Based on interviews with APS Pricing and Regulation department personnel, no

4 detailed analyses of alternative demand estimation methodologies were completed prior to

5 the implementation of the methodology using class average load factors in March 1999.

6 The Company considered the use of class average load factors to be unbiased and

7 implemented a generosity factor to ensure this methodology would tend to result in

8 underestimated demand.

9 In addition, no subsequent analyses of alternative demand estimation methodologies were

10 completed by the Company to confirm the appropriateness of its use of class average load

11 factors until the completion of the studies summarized in David Rumolo's Testimony on

12 behalf of APS' application for a declaratory order on November 23, 2004.

13

14 **Q.   Will the use of customer-specific previous month kW eliminate the possibility that**

15 **demand may be significantly over or under-estimated?**

16 A.   No demand estimating methodology can accurately predict customer behavior and the

17 resulting energy use all of the time. As shown in the above tables, however, the use of

18 customer-specific previous month kW to estimate demand reduces the number of

19 instances in which demand is significantly over or under-estimated compared to the use of

20 class average load factors.

21

22 **Q.   What is the most effective means of determining accurate usage?**

23 A.   The most effective means to improve the accuracy of demand billing is to increase the

24 percentage of times that demand billing is based on an actual demand meter reading.

25 Staff's December 28, 2004 report contains a number of recommendations targeted at

1   reducing the number of instances in which usage is estimated due to "no access"

2   situations.

3

4   **Q.**   **Is Mr. Rumolo's description of APS' demand estimating methodology as being based**

5   **on a load factor "calculated using an average figure based on all customers in that**

6   **particular rate class" accurate?**

7   A.   No, APS calculated class average load factors based on a sample, not based on all

8   customers.

9

10   **Q.**   **Do you agree with Mr. Rumolo's representation that the procedures used to estimate**

11   **reads under the "old CIS" and "new CIS" are essentially the same?**

12   A.   No, we believe that the change from the use of customer specific load factors to class

13   average load factors represents a significant change in estimating procedures. As can be

14   observed by reviewing the information in the above tables, the accuracy of the two

15   methodologies is not similar. One of the problems associated with APS' implementation

16   of class average load factors in March 1999 was that the Company did not perform any

17   analyses at that time to confirm that the use of class average load factors is as accurate as

18   the use of customer-specific load factors or other possible demand estimation

19   methodologies. In fact, APS initially implemented the use of class average load factors

20   with a "generosity factor" to provide assurance that demand would not be overestimated.

21

22   **Q.**   **Do you agree with Mr. Rumolo's statement that "the use of a class average load**

23   **factor does not bias the estimated demands and appropriately scales the demand to**

24   **the estimated energy by avoiding customer-specific anomalies that may produce**

25   **significant distortions in the estimated demand"?**

A.   In part. We agree that the use of class average load factors does not appear to bias the estimation of demand. We also agree that the use of class average load factors avoids customer-specific anomalies, although we question the implication that these anomalies occur frequently enough to be a significant factor in the selection of a demand estimation methodology. However, we dispute the importance placed on these two issues compared to the importance of using a demand estimating methodology that most accurately estimates demand. In our opinion, it is inappropriate to select a demand estimating methodology on the basis of its ability to be unbiased and avoid customer-specific anomalies without determining whether this same approach most accurately estimates customer demand.

Q.   **Finally, do you agree with Mr. Rumolo's contention that "the tariff language provides perverse incentives to customers to deny APS access"?**

A.   Mr. Rumolo contends that "a customer could deny access to APS during the hottest months of the summer and would be billed on the last demand reading that may have occurred before the high use periods." We agree that in some circumstances the use of the last actual demand reading may provide a customer with an incentive to deny access to APS. APS is currently allowed to convert a customer to a non-demand billed rate schedule in the event that a customer denies access to the meter. If the Company suspects that the customer is gaming the system, it should be able to use this existing remedy to address the "no access" problem.

Q.   **Should APS be required to adjust past usage estimations to reflect the customer-specific kW method?**

A.   Although we conclude that usage estimation methodologies based upon customer-specific kW produce more accurate results than APS' class average load factor method, we do not

1   find that the use of class average load factors to estimate demand is completely

2   unreasonable. Usage estimations calculated with the class average load factor method will

3   not be as accurate as those calculated with customer-specific kW methods. The

4   improvement in accuracy is significant enough to lead us to recommend that the

5   Commission require APS to adopt the customer-specific kW method for future use.

6   However, the class average load factor method used by the Company is not so problematic

7   as to lead us to recommend that past usage estimations be adjusted. We think that such a

8   process would not produce meaningful benefits to customers because it would require

9   significant resources to accomplish and result in little difference on a net basis in the

10   amounts that customers pay.

11

12   Q.   **Was APS unjustly enriched at the expense of Avis Read and other customers as a**

13   **result of its usage estimation practices?**

14   A.   No, we found no evidence of the purposeful overbilling of customers, and we found that

15   APS' usage estimation methodology tends to result in underbills. However, we disagree

16   with APS' decision to not retroactively identify and credit those customers whose

17   accounts were not corrected for the overestimation of demand when the actual demand

18   reading was less than estimated demand billed. This issue is discussed in more detail in

19   Section Three of this testimony.

20   As discussed in detail in the December 28, 2004 Report, Chapter IV, Finding 8, the

21   naturally occurring phenomenon of rising demand that occurs in months approaching

22   summers may reduce the possibility that overestimated demand will be discovered.

23   However, we reviewed the numbers of estimated bills by month for the residential demand

24   (EC-1 and ECT-1R) and general service demand (E-32) rate schedules for the period 1995

25   through 2004 and found no evidence of trends to support the allegation that APS

26   manipulates the demand estimating process to its own advantage.

SECTION TWO: KWH ESTIMATION METHODOLOGIES

Q. **Please describe APS' kWh estimation procedures.**

A. Since the implementation of APS' new customer information system in September 1998, APS has been estimating kWh consumption using seasonal customer-specific consumption per day times the number of days in the current billing period if the account history is available. The use of a six month seasonal average will always include consumption from the same month of the prior year. If there is insufficient history to use the seasonal average method, that is, if the customer has been a customer for less than one year, the consumption estimate will be based on the actual per day consumption from the previous month. If the previous month is in a different season, per day consumption will be calculated using the actual consumption from the same month of the prior year.

Q. **Are the issues related to over- or under-estimation of kWh consumption the same as the issues related to the over- or under-estimation of kW demand?**

A. Not completely. While customers prefer for their utility bills to be based on actual kW and kWh consumed, the over- or under-estimation of kWh consumption is trued-up in most instances in the subsequent period when the actual meter reading is obtained. This is not true with kW demand.

Q. **Is APS' kWh consumption estimation methodology reasonable?**

A. Yes, with one possible exception. The use of a customer specific seasonal consumption-per-day average is a reasonable methodology for estimating consumption and is based on customer-specific history, not class averages. Theoretically, we know of no reason why the use of this methodology should be biased in favor of over or under-estimation of consumption. However, in reviewing the detailed analyses supporting Mr. Rumolo's

November 23, 2004 Testimony, we noticed that estimated kWh consumption is generally higher than the actual kWh consumption in the month of May. May is the first month of the summer season; therefore, CIS estimates consumption billed in May using the summer seasonal average. Due to cycle billing, approximately one-half of consumption billed in May will represent energy used in April. We recommend that APS should perform an analysis to determine whether the inclusion of May as a summer season month for purposes of estimating kWh is appropriate. This analysis should be filed with the Commission within 90 days of the conclusion of this matter. This trend is reversed to some degree in the early winter season months. When viewing consumption for a complete twelve month period, we did not find that estimated consumption for the twelve month period was consistently overstated.

Commission rules specify that electric utilities shall estimate usage by considering, where applicable, the customer's usage during the same month of the previous year and the customer's usage during the preceding month. While the seasonal average will not include the amount of usage during the preceding month if the previous month is in a different season, it always considers the consumption from the same month in the previous year if the customer had service at the same premises during that period.

We reviewed all billing-related complaints sent to either the Commission or the APS Consumer Advocate's Office during the period 1995 through 2004. There were no observable trends related to the over or under-estimation of kWh consumption. In fact, it appeared that there were as many or more complaints related to underestimated consumption as overestimated consumption. As noted in the December 28, 2004 Report, the problem with the Avis Read account was that consumption was underestimated rather than overestimated.

We also reviewed selected customer information to determine if kWh consumption was estimated more accurately using one of these three kWh estimating methodologies –

1   seasonal averages, same month prior year, and previous month. Based on the analyses

2   completed, it appears that the use of prior month consumption per day provides the most

3   accurate kWh estimate, however, the use of seasonal customer-specific consumption per

4   day results in the net underestimation of kWh on average of only 1.9 percent for those

5   customers reviewed.

6

7   **SECTION THREE: UNADJUSTED OVERBILLING OF DEMAND**

8

9   **Q.   Please explain why you believe that refunds are due to customers as the result of**

10   **APS' over-billing of demand.**

11   A.   In September 2003, APS programmed its customer information system (CIS) to

12   automatically identify and report as a billing exception those instances in which the actual

13   demand reading was less than the previously estimated demand. This programming

14   change allowed the Company to routinely identify those instances in which estimated

15   demand exceeded actual demand so the customer's account could be credited for the

16   difference. Before this programming change, these instances could not be routinely

17   identified. APS decided not to apply this change retroactively. As a result, there were

18   customers whose demand was over-estimated prior to September 2003 and whose

19   accounts were not credited for the overbilling.

20

21   **Q.   What is the dollar amount due customers as a result of the overbilling of demand?**

22   A.   Based on information provided by the Company in response to Staff DR 11-2, there are

23   9,056 residential customers affected by the uncorrected overbilling of demand. The

24   amount to be adjusted totals $171,686. APS is still in the process of determining the

25   required adjustment for general service customers. APS' calculation of these refunds will

26   *be subject to verification as part of the independent audit recommended by Staff.*

1 Q.   **Should APS be required to credit customers' accounts for interest accrued on the**

2   **over-billed demand?**

3 A.   Yes. In this instance, APS knew that some of its customers may have been over-billed.

4   APS knowingly decided not to retroactively refund customers' overpayments of estimated

5   demand and has had the interest-free use of customers' funds for several years.

6

7 Q.   **What interest rate should be used to calculate interest on overbilling?**

8 A.   APS should calculate interest on overbilling using the same rate it currently uses to

9   calculate interest on customers' deposits.

10

11 Q.   **What should APS be required to do if the customers who were over-billed demand**

12   **are no longer active customers?**

13 A.   APS should take reasonable steps to locate those customers who are no longer active

14   customers. For those customers located, APS should issue refund checks for the amount

15   of the unadjusted overbilling and related interest. We recognize, however, that it is not

16   reasonable for APS to incur costs to locate customers when the amount of the potential

17   refund is insignificant. Therefore, we recommend that APS be required to make refunds

18   to inactive customers only in those instances in which the potential refund is greater than

19      $5.00. APS should be required to maintain documentation of steps taken to locate

20   individual inactive customers.

21

22 Q.   **How does this relate to the unadjusted overbilling of demand recommendation**

23   **included in Staff's December 28, 2004 Report?**

24 A.   The December 28, 2004 Report contained the following recommendation.

25   "APS should evaluate the extent to which customers were over-

26   billed or under-billed during the period 1998-2003. APS should

1   identify those customers who are due credits because their

2   estimated demand was not adjusted downward when the actual

3   demand read came in less than the estimate. APS should also be

4   required to provide a credit to customers who were over billed.

5   Within ninety days of a decision in this matter APS should file a

6   report that details the results of its analysis and identifies

7   mechanisms by which it could provide refunds to customers who

8   were overbilled."

9   Since the report was issued, APS has identified the number of residential

10   customers and the amounts overbilled related to this recommendation. These are

11   the amounts discussed above as having been provided in response to Staff DR 11-

12   2.

13

14   ## SECTION FOUR: COMPARATIVE PRACTICES – OTHER

15   ## ARIZONA ELECTRIC UTILITIES

16

17   Q.   **Did Staff request additional comparative information from other Arizona electric**

18   **utilities subsequent to the issuance of the December 28, 2004 Staff report?**

19   A.   Yes. Staff has asked other Arizona electric utilities to provide the total number of

20   customer bills estimated by month by rate schedule as well as the reasons for the estimates

21   for the period 1995 to the present. Staff also asked each utility to describe its practice for

22   securing an actual meter reading and its business rules used for exception reporting of

23   high and low consumption.

24

25   Q.   **How does APS' percent of estimated bills compare with other Arizona electric**

26   **utilities?**

1 A.   APS' estimated bills as a percent of total bills declined slightly from approximately 1.4

2   percent in 1995 to under 1.2 percent in 2004, while peaking in 1998 and 1999 at

3   approximately 2.0 percent. Please refer to Chapter III of the December 28, 2004 Report

4   for a more detailed discussion of APS' percent of estimated bills.

5   The following table summarizes the responses received from the other Arizona electric

6   utilities.

Utility	Average Percent of Estimated Bills – Range per Year
Duncan Valley Electric Cooperative, Inc.	0.00% - 0.15%
Garkane Energy Cooperative, Inc.	No estimates
Graham County Electric Cooperative, Inc.	0.21% - 0.52%
Mohave Electric Cooperative, Inc.	3.9% (data available for 2004 only)
Navopache Electric Cooperative, Inc.	0.06% - 1.28%
Trico Electric Cooperative, Inc.	0.33% - 0.60%
Tucson Electric Power Company	0.12% - 1.22%
UNS Electric, Inc.	0.35% - 0.39%

7   APS' percent of bills estimated is generally higher than that of the other Arizona electric

8   utilities. Mohave Electric, the only Arizona electric utility with a higher percentage of

9   estimated meter reads, had a high percentage of estimated meter reads in 2004 due to the

10   termination of its contract with a contract meter reading company in December without a

11   sufficient number of replacement meter readers available to avoid rendering customers'

12   bills based on estimated usage. APS has significantly more demand-billed customers,

13   both in numbers and as a percent of total, than the other Arizona utilities. These demand

14   meters must be physically probed in order to reset demand, thereby requiring access to the

15   meter. As a result, APS presumably has fewer opportunities to "scope" the meter reading

1   compared to the other utilities in the event access to the meter is restricted. This would

2   contribute to the observed differences in the percents of bills estimated.

3

4   **Q.**   **How do APS' practices to secure an actual meter reading compare with the practices**

5   **of other Arizona electric utilities?**

6   A.   APS's practices to secure an actual meter reading are also described in detail in Chapter

7   III of the December 28, 2004 Report. The practices of the other Arizona electric utilities,

8   as described by each individual utility, are shown in the following table.

9

Utility	"No Access" Practices
Duncan Valley Electric Cooperative, Inc.	Meter readers will visit customer premises as many times as practical during the meter reading cycle to obtain an actual meter reading. We may also call the customer and ask to have them read the meter. Obtaining a reading from every meter can at times be difficult where we have a number of meters located at remote mountain tops and ranches. We have installed power line carrier AMR meters at most of these locations, but there are still times when the AMR meters fail to read. Since we are small and have only one billing cycle per month, when we connect a customer at these remote locations we explain that it may become necessary to estimate a reading so as to not delay a billing cycle. The operations manager tries to contact customer by phone to describe the nature of the problem. If necessary, the operations manager will visit the customer premises to more clearly explain the issue. If phone or visits cannot be made a certified mailing is sent notifying the customer of the nature of the problem and to make contact with the Cooperative to discuss options.
Garkane Energy Cooperative, Inc.	NA – no meters are estimated. In remote areas of the system, Garkane has installed Turtle Meters which send an electronic meter reading.
Graham County Electric Cooperative, Inc.	If access to a meter is hindered the meter reader contacts the office and asks them to attempt to reach the owner. If the owner is unavailable then additional attempts during the cycle are made to gain access and to contact the owner. If all attempts are unsuccessful then an estimate is made.
Mohave Electric Cooperative, Inc.	During the past year, there have been no situations where an actual meter reading was not obtained when there was an access issue. No readings were estimated during 2004 due to a lack of access to the meter. Documentation for situations prior to 2004 is not available. Historically, access issues have been rare, but when such issues have occurred, standard procedure initially requires an attempt to contact the customer by telephone. If unsuccessful, the telephone call is followed by a certified letter to the customer.

Utility	"No Access" Practices
Navopache Electric Cooperative, Inc.	When a meter reader cannot access a meter it is flagged and reported to Safety and Loss Control. This department contacts the customer. No further attempt is made by the meter reader to get a reading. If the meter is a 3-phase or demand meter, several attempts are made, if the reading is still unavailable the customer is contacted immediately and we work with the customer until a reading is secured.
Trico Electric Cooperative, Inc.	After the second consecutive month of estimating the consumer's bill for reasons other than severe weather, the Cooperative will make every attempt to secure an accurate meter reading. The first billing cycle (month) will show as an estimate on the bill with the reason. If this is an access issue, i.e. blocked meter, vicious animal, locked gate, etc., we will then send a letter restating the reason and asking the customer to change the condition. If no change by the third month, another letter is sent, and if by the fourth month there has been no resolution we notify the customer of our right to disconnect service to their location.
Tucson Electric Power Company	1. Field personnel fill-out door tag in detail and leave at customer's residence. Turn-in form with specific access information to group leader. 2. Group leader / supervisor refers information to Customer Service No Access Desk. 3. Customer Service Representative places telephone call to customer within 4 days of receiving written information. Two telephone attempts must be made. Attempts must take place on two different days at different times of the day. Document dates and times phone calls are made / messages left. 4. Customer Service sends Letter A to customer within 2 days of phone call being completed. 5. Customer Service sends Letter B to customer within 2 days of receiving notice of 2nd accessibility failure. 6. Customer Service sends Letter C, by certified mail, within 2 days of receiving notice of 3rd accessibility failure. 7. Disconnect, if necessary, on or after date specified in Letter C. Note: Letters B and C notify customer of possible discontinuance of service and that reconnection will not occur until the accessibility issue has been resolved to the satisfaction of TEP and customer pays reconnect charge of $150.
UNS Electric, Inc.	This process is followed for residential rate customers and small general rate customers. If a large general rate customer read is involved, a read is pursued until successful. No large general rate customer/demand metered customers are estimated. As provided in the tariffs, we will estimate no more than two consecutive bills. First time: 1. The account of a no-access read is noted on the customer's account. 2. A postcard is mailed to the customer explaining that UNS Electric did not have access for a meter read and that their bill will be estimated. Second time: 1. due to a no-access read again, the customer's account is noted again.

Utility	"No Access" Practices
	2. A second postcard is mailed to the customer indicating this is the second notice and they are to please contact the office for resolution.
	Third time:
	1. The account of a no-access read is noted on the customer's account.
	2. A service order is generated for a customer service person to be sent out to the address, obtain a read and make contact with the customer.
	Issues are usually resolved at this point. However, if they are not resolved, listed below are the different steps that can be taken:
	1. If the customer service person comes back and has the read and had no trouble getting the read, the meter reader is informed that a read is expected in the future.
	2. If the customer service person discovers it is indeed an access issue, he/she negotiates a resolution with the customer and returns with a read and a plan which is conveyed to the Bill technician and the Meter Reader for future reads.
	3. If the customer service person is unable to negotiate a resolution, that information is reported back to the Bill Technician. The Bill Technician will make an attempt via telephone to contact the customer, explain the situation and obtain satisfaction for future access.
	4. If the customer is uncooperative (none in the last year or so), as a last resort, a standard letter is sent to the customer, along with the tariff that indicates that UNS Electric has a right to safe access to its meter for meter read and maintenance purposes. The tariff and letter indicate clearly the consequences and includes that they can be cut at the pole if an access problem is not resolved or continues.

1 APS' practices to secure an actual meter reading do not appear significantly different than

2 those practices in place at other Arizona utilities. However, TEP will ultimately send the

3 customer a certified letter indicating that access must be provided or that service will be

4 disconnected. APS does not send certified letters as part of its access resolution process.

5

6 **Q. Based on this information, are there practices that you believe should be adopted by**

7 **APS?**

8 A. Yes, we believe that APS should enhance its "no access" resolution process to include the

9 sending of certified letters at the time it notifies customers that continued "no access" will

10 result in the possible discontinuance of service.

11

1 **Q. How do APS' business rules used for exception reporting of high and low**

2 **consumption compare with the practices of other Arizona electric utilities?**

3 A. APS' business rules used for exception reporting of high and low consumption have

4 changed over time. The "old CIS" reported exceptions if kWh usage was nine (9) times

5 higher or less than one-ninth the kWh of the comparable period. Under the "new CIS,"

6 the business rules changed to ten (10) times higher or less than one-seventh (0.14) the

7 comparable kWh using six-month seasonal information. In September 2003, the business

8 rule was changed to seven (7) times higher for residential customers using seasonal

9 information.

10 The following business rules are used by other Arizona electric utilities for consumption

11 exception reporting:

Utility	Consumption Exception Reporting Business Rules
Duncan Valley Electric Cooperative, Inc.	A reading that results in a usage change of +/- 50% will generate an exception report.
Garkane Energy Cooperative, Inc.	If the monthly kWh consumption exceeds 1.99 times the average monthly usage or 1/2 the average low consumption.
Graham County Electric Cooperative, Inc.	The Company writes an exception report on each read cycle that shows high and low consumption. The customer is reported high if the billing amount exceeds the high billing amount specified in a rate file. The customer is reported low if the billing amount is below the minimum specified in the rate file.
Mohave Electric Cooperative, Inc.	The billing software used by Mohave develops a "normal" or average usage for each customer each month. Mohave has then selected high and low variance limits based on the season of the year. These high and low variance limits are used by the software to generate variance reports that identify all accounts which fail the high-low variance test. During summer months, a usage that is over 200% higher than normal or over 35% lower than normal will be placed on a variance report for review. During the winter months, the variance percentages are set at 175% and 35%. These variance percentages are based on a determination of what are reasonable variances considering the temperature extremes experienced in the area.
Navopache Electric Cooperative, Inc.	Navopache's computer generates high and low consumption exception reports. This report is reviewed by revenue class and exceptions investigated. Navopache has a large base of seasonal members, variations in this revenue class are not

Utility	Consumption Exception Reporting Business Rules
	unusual.
Trico Electric Cooperative, Inc.	Trico's exception reporting is called a Prebill report, which is run daily. Accounts are flagged when they fall into the high/low percentage determined by our rate schedules. Flagging also occurs if consecutive months have the same kWh usage or if the maximum kWh usage by rate for that account is exceeded.
Tucson Electric Power Company	There are parameters defined in the CIS which produce a billing error if outside parameters. If a current bill is 2.5 times higher than the previous month's bill or 0.75 times less than the previous month it comes out on the Billing Errors for an Account (BERA) List. An exception billing administration specialist then determines if an investigation order should be issued or if the bill is acceptable.
UNS Electric, Inc.	UNS Electric's method of HILO value creation is to compare current month's premises usage to last year same month premises usage. If last year's data is missing, the current month is compared to last month's premises usage. Lacking both, current month consumption is compared to a peer estimate value created in the UGEN batch, using the same last year/last month values as stated above.

These responses suggest that APS' parameters for high-low consumption exception reporting are less restrictive than those practices in place at the other Arizona electric utilities. Therefore, it is possible that APS will have a higher percentage of bills based on inaccurate meter readings mailed directly to customers without billing department review than other Arizona electric utilities.

Q. Why are these business rules important?

A. These rules are important because they determine which bills are exception-reported. When exception-reported, billing services representatives will manually review the reported consumption and may issue a request for a field-verified read if the reported consumption is considered to be out-of-line. In other instances, the representative may determine that the index was misread and may correct a meter reading without having the meter reading field-verified. These activities ensure that customers receive bills based on accurate meter readings.

1 ## SECTION FIVE: COMPARATIVE PRACTICES – OTHER JURISDICTIONS

2

3 **Q.** **Has Staff received additional information from other state utility regulatory**

4 **agencies?**

5 A. Yes, Staff received responses from the State of Michigan Public Service Commission and

6 the Missouri Public Service Commission.

7

8 **Q.** **Is the information received from these Commissions pertinent to this inquiry?**

9 A. Yes, the information received from these commissions is consistent with some of the

10 findings in the December 28, 2004 Report. However, neither state provides information

11 related to demand estimation since neither state has electric tariffs that include a

12 residential demand charge.

13

14 **Q.** **Please summarize the Michigan and Missouri rules related to estimated billing.**

15 A. The Michigan rules allow a utility to estimate the bill of a residential customer every other

16 month, and may allow a utility to estimate the bills more or less often depending upon a

17 finding by the Commission that those procedures assure reasonable billing accuracy.

18 However, estimating procedures employed by a utility and any substantive changes to

19 those procedures must be approved by the Commission. A utility may also estimate bills

20 if extreme weather conditions, work stoppages, or other circumstances beyond the control

21 of the utility prevent an actual meter reading. If the utility is unable to gain access to read

22 a meter, then the utility shall use reasonable alternative measures to obtain an actual

23 reading, including mailing or leaving postage-paid, pre-addressed postcards. If a utility

24 cannot obtain an actual reading, then the utility shall maintain records of the reasons and

25 its efforts to secure an accurate reading.

The Missouri rules allow a utility to render a bill based on estimated usage when extreme weather conditions, emergencies, labor agreements, or work stoppages prevent actual meter readings and when a utility is unable to obtain access to the customer's premises. If a utility is unable to obtain an actual meter reading, it shall undertake reasonable alternatives if practicable to obtain a customer reading of the meter, such as mailing or leaving postpaid, preaddressed postcards upon which the customer may note the reading unless the customer requests otherwise. A utility shall not render a bill based on estimated usage for more than three (3) consecutive billing periods. Under no circumstances shall a utility render a bill based on estimated usage unless the estimating procedures employed and any substantive changes to those procedures have been approved by the Commission. A utility shall maintain accurate records of the reasons for the estimate and the effort made to secure an actual reading. Based on discussions with Missouri Staff, utilities generally estimate usage using historical customer specific information (prior month or same month prior year), but may also trend or weather-normalize usage. There are no demand-billed residential customers in Missouri.

SECTION SIX: METER READING PRACTICES

Q. **Please describe the results of your interview of the meter reader and meter reading supervisor responsible for the Avis Read account in Paradise Valley in 1999 and 2000.**

A. We interviewed the primary meter reader assigned to read the meter at Avis Read's Paradise Valley premises in 1999 and 2000. The meter reader described the reasons he was unable to access the meter at Avis Read's residence. While Ms. Read had provided APS with a key to her gate, eventually the gate key provided by Avis Read went missing. The meter reader stated that it is APS' policy that meter readers make "reasonable"

1   attempts to gain access to the meter, although "reasonable" practices do not include

2   knocking on the customer's door. The meter reader stated that "no access" practices

3   include leaving a door hanger and coding the meter as locked.

4   The meter reading supervisor was not made aware of the "no access" situation at the Avis

5   Read property until January 2005 when we requested this interview. He did not think that

6   he had ever been to the Avis Read residence, and he did not make contact with Avis Read

7   during the period of 1999-2000 to discuss alternatives to resolve the "no access" problem.

8   Neither the meter reader nor meter reading supervisor could recall whether APS

9   telephoned Avis Read to arrange for the replacement of the missing key or to replace the

10   gate lock with an APS lock. According to notes recorded in CIS, Ms. Read had offered to

11   allow her lock to be replaced with an APS lock.

12   The meter reader indicated that many additional "no access" situations could be remedied

13   if APS installed more of the EZRead 90-degree elbows. These elbows change the angle of

14   the meter and facilitate reading meters. In response to this suggestion, the meter reading

15   supervisor indicated that meter reading shop personnel make site visits to each customer's

16   premises reported by meter readers as locations where "no access" problems could be

17   solved through the installation of an EZRead 90-degree elbow to determine the feasibility

18   of installing these devices.

19

20   Q.   **Please describe the work completed to determine if APS meter readers are curbing**

21   **meter reads.**

22   A.   We interviewed the route coordinators and meter reading supervisor (or head meter

23   reader) at the Flagstaff and Surprise meter reading shops to identify practices in place to

24   detect the curbing of meter reads, evaluate individual meter reader performance, and

25   monitor lock-outs. We also reviewed selected Itron reports provided by APS and did not

26   detect instances of curbing. While APS reviews individual meter reader performance

1   reports for evidence of excessive lock-outs by meter reader, they do not consistently

2   review reports to track lock-outs by meter reading route. Using available DB Microware

3   reports to review lock-outs by route provides management with another valuable tool to

4   monitor trends in lock-outs and reduce the number of "no access" meters. DB Microware

5   is the software used by APS to manage meter reading routes.

6   In addition, we reviewed descriptions of the disciplinary actions taken against meter

7   readers during the period 1994 through 2004. During that time period, there were three

8   instances in which meter readers were terminated for "curbing" meter reads, one in late

9   2004, the other two in 1994 and 1995. Chapter III, Finding 10 of the December 28, 2004

10   Report (pages III-10 to12) provides additional discussion of controls in place related to the

11   "curbing" of meter reads.

12

13   Q.   **Do meter readers have access to prior month usage on the Itron hand-held meter**

14   **reading units that could facilitate the curbing of meter reading?**

15   A.   In our December 28, 2004 Report, we mention that in areas outside of Metro Phoenix the

16   prior month's meter reading and customer usage are displayed on one of the Itron screens

17   that meter readers can access. Having access to this information provides meter readers

18   with information that could facilitate the curbing of meter reading. We recommended in

19   the December report that this feature be disabled. Recent discussions with Flagstaff meter

20   reading personnel have confirmed that APS has recently issued instructions to disable this

21   feature.

22

23   Q.   **Do you have any additional recommendations related to meter reading based on the**

24   **additional work completed?**

25   A.   Yes, we have four additional recommendations related to meter reading. First, APS

26   should be required to develop and install performance measures to document the efforts

1   taken by APS to comply with the Commission requirement that "(a)fter the second

2   consecutive month of estimating the customer's bill for reasons other than severe weather,

3   the utility will attempt to secure an accurate reading of the meter. (R14-2-210. A. 3.).

4   Second, APS should specifically include the use of EZ-Read as one of the steps taken to

5   resolve a "no access" situation. Third, APS should utilize available DB Microware reports

6   to review lock-outs by route to monitor trends in lock-outs and to reduce the number of

7   "no access" meters. Fourth, APS should establish an internal process whereby after three

8   consecutive estimates, continued instances of consecutive estimates due to "no access"

9   situations are reported and made visible to increasing levels of APS management.

10

11   **SECTION SEVEN: REVENUE REQUIREMENT IMPACT**

12

13   Q.   **What is the revenue requirement impact of the Company's demand estimating**

14   **methodologies?**

15   A.   During 2002, the Company estimated 25,510 E-32 (general service) customer bills, 4,201

16   EC-1 (residential) customer bills, and 5,589 ECT-1R (residential TOU) customer bills.

17   Using 2002 data for our test period and using information provided by APS that supported

18   the analyses included in David Rumolo's November 23, 2004 testimony, related to the

19   over and under billing of demand using the class average load factors in place during

20   2002, BWG estimates that APS underbilled its E-32 customers by approximately

21        $245,000, underbilled its EC-1 customers by approximately $45,000, and underbilled its

22   ECT-1R customers by approximately $165,000, for a total underbilling of approximately

23        $455,000. If Staff's recommended estimation methodology had been in use in 2002,

24   revenues would have been $455,000 higher.

25

1 Q. **Please describe in more detail BWG's calculation of the impact of APS' demand**

2   **estimating methodology on APS' revenues.**

3 A. The following table presents the detail supporting BWG's calculation of the impact of

4   APS' demand estimating methodology on test year revenues.

5

Rate Schedule	Customer Class	APS Estimate of Net Under Billing for 12 Months ended August 2004	Number of Estimated Bills – 12 Months ended August 2004	Number of Estimated Bills – Calendar 2002	Dollar Impact – Calendar 2002
EC-1	Residential	$22,271	2,052	4,201	$45,539
ECT-1R	Residential TOU	$143,117	4,797	5,589	$166,746
E-32	General Service	$205,283	21,452	25,510	$244,116
Total		$370,671	28,302	35,300	$456,401

6   In August 2002, the Company adjusted the class average load factors to remove the

7   "generosity factor." As a result, BWG's calculation of the net underestimation for 2002

8   prorated the results of the APS analyses using the demand estimating methodology

9   implemented in March 1999 and the methodology implemented in August 2002. The

10   class average load factor used to estimate demand for rate ECT-1R was also adjusted in

11   April 2004 to correct an error in the calculation of the on-peak load factor.

12

13   **SECTION EIGHT: SUMMARY OF STAFF RECOMMENDATIONS**

14

15 Q. **Please summarize all the recommendations related to the Staff inquiry into the usage**

16   **estimation, meter reading, and billing practices of Arizona Public Service Company.**

17 A. A complete list of all recommendations related the Staff inquiry into the usage estimation,

18   meter reading, and billing practices of Arizona Public Service Company follows.

19

Monitoring and Compliance with Commission Recommendations

- APS should be required to participate in a third party audit by an independent auditor selected by Staff and funded by APS. This audit would be focused on evaluating whether the Company's meter reading, billing, and estimation practices and management processes have been improved. The audit would also evaluate whether the Company has complied with the decision in this matter. The audit would take place within twelve months of a decision in this matter.

- APS should be required to file an implementation plan with the Commission within sixty days of a decision in this matter that identifies how it will comply with the decision in this matter. This implementation plan should be submitted for Commission approval.

- APS should be required to commence an internal audit of its compliance with Commission rules and Commission-approved tariffs within three months of the close of this proceeding and complete the audit, with a copy of the audit report to be filed with the Commission, within twelve months of the close of this proceeding. APS completed a "CIS Compliance to ACC Rules and Regulations Audit" in August 2002; however, this audit failed to identify that APS was not estimating usage for residential demand in conformance with the tariff provisions for Rate Schedules EC-1 and ECT-1R.

- APS should be required to provide documentation that lists the customers who were not issued three or more bills as a result of APS' CIS problems during late 1999 and early 2000. Staff believes that three or more missed bills might indicate a systemic problem that may warrant further investigation. This documentation should also describe all the circumstances surrounding these customers' accounts so that the Commission may evaluate whether they were impacted in a manner similar to Avis Read. For example, this report should indicate whether APS offered customers

1   extended payment terms once the backbill was issued, describe what terms were

2   offered, and discuss whether APS communicated with these customers to make them

3   aware of the billing problems.

4   **Meter Reading**

5   • APS should be required to provide evidence to the Commission that new procedures

6   have been put in place to ensure that staffing resources are sufficient to address

7   emergency short-term needs for meter reading shops that are either smaller or remote.

8   A report that describes the new procedures and explains how they reduce the potential

9   for "skipped" meter readings due to staffing resource issues should be provided to the

10   Commission within six months of a decision in this matter.

11   • APS should be required to revise the "No Access Meters" report, KM06R20, to

12   provide the following additional features:

13   – Report the present number of consecutive months that the meter reading

14   department could not access the meter so that the Administrative Coordinator can

15   track the steps required for each month of access problems and prioritize the APS

16   response.

17   – Report the other instances that the meter reading department was unable to read the

18   meter during the previous twenty-four months to simplify identification of

19   recurring "no access" problems at the same premises.

20   – Prioritize accounts to focus first on demand-billed customers when working the

21   "no access" report. APS should compile and maintain these reports for purposes

22   of the independent audit.

23   • APS should be required to develop and install performance measures to document the

24   efforts it has taken to comply with the Commission requirement that "(a)fter the

25   second consecutive month of estimating the customer's bill for reasons other than

severe weather, the utility will attempt to secure an accurate reading of the meter. (R14-2-210. A. 3.).

- APS should specifically include the use of EZ-Read as one of the steps taken to resolve a "no access" situation.

- APS should utilize available DB Microware reports to review lock-outs by route to monitor trends in lock-outs and reduce the number of "no access" meters.

- APS should establish an internal process whereby after three consecutive estimates, continued instances of consecutive estimates due to "no access" situations are reported and made visible to increasing levels of APS management.

- APS should enhance its "no access" resolution process to include the sending of certified letters at the time it notifies customers that continued "no access" will result in the possible discontinuance of service.

- APS should develop and install a performance measure to monitor the extent to which APS is complying with the Commission requirement to read meters each month (no less than twenty-five days after the last meter read and no more than thirty-five days after the last meter reading). APS should provide to the Commission a description of its performance measure and the results of its analysis within six months of a decision in this matter.

- APS should change the options settings in the Itron software in all locations so that the Itron HHC used by meter readers in each of the APS meter read shops no longer includes the last month's usage and last month's meter reading. This feature should be disabled throughout APS' service territory within 30 days of a decision in this matter.

- APS should provide the Commission with quarterly reports related to the status of the remote meter reading pilot and implementation plans. The reports should provide a description of the meter reading technology being implemented, APS' plan for implementation, the number and type of customers involved in the pilot program, the

1   costs associated with its implementation, and the operational efficiencies associated

2   with its implementation.

3   • APS should implement a pilot program to evaluate whether using an auto-dialer to

4   communicate with "no access" account customers prior to the scheduled read date, in

5   addition to the other methods presently used, will facilitate resolution of additional "no

6   access" accounts. The Company should maintain records on the number of instances

7   that the auto-dialer is used to call customers in these circumstances so that one may

8   determine whether use of the auto-dialer improves APS' access to "no access" meters.

9   The results of the pilot program should be reported to the Commission in quarterly

10   reports.

11   • APS should implement a pilot program to evaluate whether scheduling appointments

12   with "no access" account customers results in a reduction of estimated reads due to

13   "no access" problems. The results of the pilot program should be reported to the

14   Commission in quarterly reports.

15   • APS should be required to implement a policy to ensure that meter reading supervisors

16   periodically inspect meter locations reported as "no access" to verify that appropriate

17   corrective measures are taken. APS should be required to file a copy of this policy

18   with the Commission within ninety days of a decision in this matter.

19   **Usage Estimation and Billing**

20   • APS should be required to change the methodology used to estimate demand from one

21   using class average load factors to one using customer specific historical demand. The

22   use of customer specific demand history results in more accurate demand estimates.

23   • APS should perform an analysis to determine whether the inclusion of May as a

24   summer season month for purposes of estimating kWh is appropriate. This analysis

25   should be filed with the Commission within 90 days of the conclusion of this matter.

26   In reviewing the detailed analyses supporting Mr. Rumolo's November 23, 2004

1 Testimony, we noticed that in the month of May that estimated kWh consumption was

2 generally higher than the actual kWh consumption. May is the first month of the

3 summer season, therefore, CIS estimates consumption billed in May using the summer

4 seasonal average. Due to cycle billing, approximately one-half of consumption billed

5 in May will represent energy used in April. This trend is reversed to some degree in

6 the early winter season months.

7 • APS should be required to refund to customers the overbilled demand charges plus

8 interest that occurred during the period starting in September 1998 with the

9 implementation of the new CIS through September 2003 when changes were made to

10 the Company's CIS to correct this problem. There were 9,056 residential customers

11 overbilled based upon inaccurate demand estimation and the overbilling was not

12 subsequently credited to the customer's account during this period. The amount of the

13 overbilling which should be credited to the appropriate residential customers' accounts

14 totals $171,686. APS is still compiling data for general service customers. APS'

15 calculation of these refunds will be subject to verification as part of the independent

16 audit recommended by Staff.

17 • APS should be required to obtain Commission approval of its estimation procedures as

18 a tariff filing.

19 • APS' Audit Services Department should include on-going testing of usage estimation,

20 meter reading and billing practices in its annual audit plan. APS should also ensure

21 that it has completely implemented any findings reported in previous audit reports.

22 APS should file the results of its internal audits with the Commission.

23 **Comparative Practices**

24 • APS should take steps to obtain actual meter readings at customer premises that have

25 persistent "no access" problems. The Company's established practice does not include

scheduling a meter reading at other than normal business hours or making an appointment for a meter reading.

- APS should continue to participate in benchmarking studies that compare its practices to other utilities in the industry. APS should provide such benchmarking analysis to Staff on a quarterly basis.

Avis Read Complaint

- APS should be required to train Billing Services Representatives (BSRs) and others involved in the usage estimation, meter reading and billing process to understand that customers value an accurate bill more than an underestimated bill. APS should also train them to recognize situations in which the underestimation of usage may result in problems for their customers. APS should provide Staff with a description of the changes to its training process within six months of a decision in this matter.

- APS should be required to provide a clearer notice on a re-billed account. Such notice should clearly state that the new bill replaces the previously issued bill and that the customer should only pay the reissued bill amount. APS should consult with Staff in determining the appropriate language and placement on the bill within 30 days of a decision in this matter. In addition, APS should be required to make the appropriate modifications to its billing system to implement this change within sixty days of a decision in this matter.

SECTION NINE: MISCELLANEOUS

Q.   Please explain why it is important that APS be required to participate in a third party audit by an independent auditor.

A.   We have completed numerous independent audits of utilities for utility regulatory commissions. Based on our experience, the benefits of requiring APS to participate in a

1   third party audit by an independent auditor are two-fold. First, the audit will provide

2   additional incentive to APS to implement the recommendations listed above on a timely

3   basis. Second, the audit will provide the Commission with an independent assessment of

4   and assurance that the actions taken by APS were responsive to the recommendations

5   ordered by the Commission.

6

7   Q.   **Please explain why it is important that APS' estimating procedures be dealt with as a**

8   **tariff item.**

9   A.   It is important that APS' estimating procedures be dealt with as a tariff item for two

10   reasons. First, providing additional language in the Company's tariff will clearly specify

11   Commission requirements related to the methodology used to render customers' bills.

12   Second, the inclusion of specific tariff language will hold APS to a greater degree of

13   accountability for compliance with the Commission's intentions related to the desired

14   usage estimating procedures.

15

16 Q.   **Are you familiar with Resolution G-3372 approved by the California Public Utilities**

17   **Commission (CPUC) on January 13, 2005?**

18 A.   Yes. This Resolution, which was approved by the CPUC on January 13, 2005, requires

19   changes to Pacific Gas and Electric Company's (PG&E) tariff. These tariff changes limit

20   a residential customer's exposure to three months for under-billings resulting from a

21   failure to issue a bill or from underestimating consumption. The failure to issue a bill and

22   the issuance of bills based on estimated usage for situations within the control of PG&E

23   are now defined as "billing errors." The Resolution excludes estimated bills resulting

24   from "inaccessible roads, the customer, the customer's agent, other occupant, animal or

25   physical condition of the property preventing access to PG&E's facilities on the

customer's premise, other causes within control of the customer, or a natural or man-made disaster such as a fire, earthquake, flood or severe storms."

As background, the CPUC received numerous complaints from PG&E customers in 2003 and 2004 claiming that PG&E failed to bill them for actual gas or electric use on a regular monthly basis or that PG&E allegedly estimated a customer's bills for several months and later rendered a back bill for undercharges. In 2003, PG&E issued a relatively large number of delayed bills (i.e., bills issued more than sixty (60) days after gas or electric usage occurred) due to problems associated with the implementation of PG&E's new Customer Information System.

The CPUC ordered PG&E to file a report explaining the reasons for the large number of delayed and estimated bills over the past five years and a plan for reducing the number of these bills. While the CPUC has not yet ordered a review of PG&E's past billing practices, the CPUC has stated that "if this review is undertaken it may include consideration of whether PG&E should be ordered to make refunds on, or adjustments to, previously rendered bills."

In addition, this Resolution requires PG&E to include a message on the estimated bill that identifies the reason for requiring that the bill be estimated.

Q. **Did you participate in the preparation of the Staff's December 28, 2004 Report.**

A. Yes.

Q. **Are you sponsoring the Staff's December 28, 2004 Report?**

A. Yes.

Q. **Does this conclude your direct testimony?**

A. Yes, it does.

EXHIBIT 1

PERRY L. WHEATON, CMC, CPA

Co-Founder and Co-President   **BARRINGTON-WELLESLEY GROUP**

SUMMARY OF QUALIFICATIONS

Mr. Wheaton, a CMC, has over thirty years of diversified management consulting and auditing experience and has performed financial operations and/or affiliate interest reviews for over twenty-five utilities. He has directed twenty-four management reviews of public utilities for regulatory commissions. A Certified Management Consultant, he has served as chairman of the General Committee of Management Services for the New York State Society of CPAs and as regional vice president and director of the Institute of Management Consultants.

Mr. Wheaton was a senior vice president of the Putnam Financial Services Company where he was responsible for the information systems operations of this major mutual fund investment management company. In his twelve years as an auditor and consultant with an international accounting firm, he had extensive experience in reviewing the financial and systems operations of utilities, financial services companies, energy companies, and manufacturers. Mr. Wheaton has an AB from Hamilton College and an MBA in public accounting from Rutgers University.

Utility Consulting Experience

- Directed the deferred balance account prudence audit of three NJ electric utilities-PSE&G, JCP&L and Atlantic City Electric—for the NJ BPU for the period from August 1, 1999 to July 31, 2003. (2002- 2004)

- Directed a diagnostic management audit of United Illuminating for the Connecticut DPUC. (2003)

- Directed the review of Pacific Gas & Electric's financial condition for the California PUC in the midst of the California energy crisis. The audit addressed holding company, power purchases, and non-regulated subsidiary activities in the California energy markets. (2001)

- Directed a project for Public Service Electric & Gas to prepare its affiliate interests compliance plan which was filed with the New Jersey BPU during the second quarter of 2000. (2000)

- Directed a management audit of the affiliate relations of Southern Connecticut Gas Company for the Connecticut DPUC. A major focus of this audit was to assess questionable activities performed by the utility's non-regulated affiliates. (2000)

- Directed the review of Connecticut Light & Power Company's (CL&P) financial condition for the Connecticut DPUC in the midst of Northeast Utilities' (CL&P's parent) financial crisis, which was precipitated by the Millstone nuclear crisis. Also assisted the DPUC in developing a strategy for dealing with the crisis and to prepare for industry deregulation. (1998)

- Directed the review of the financial impact of the Three Mile Island accident on its owners, Metropolitan Edison and Penelec, for the Pennsylvania PUC. Served as a lead witness before the PUC and a special US congressional committee investigating the accident. (1980)

- Directed a prudence review of the Maine Yankee Atomic Power Company for the Maine PUC. Subsequently reviewed the prudence of the decision to shut down the plant prematurely. (1997)

- Project director for the financial/management audit of Pacific Gas & Electric's $600 million of expenditures, from 1990 to 1992, for demand-side management for the California Public Utilities Commission (CPUC). (1994)

- Project director for the financial/management audit of Southern California Edison's Research, Demonstration and Development Department's $300 million of expenditures from 1988 to 1992 for the CPUC. (1993)

- Lead consultant for determining net merger-related savings in the management audit of the merger of SBC and Ameritech for the Illinois Commerce Commission. (2000)

- Reviewed the affiliate relationships of Peoples Natural Gas with its parent, Consolidated Natural Gas, as part of the audit of Peoples for the Pa PUC. (1994)

- Reviewed the affiliate relationships of New Jersey Natural Gas with its parent New Jersey Resources Corporation and its seven affiliated companies as part of the management audit for the New Jersey BRC. (1993)

- Developed a plan to integrate the accounting and financial operations of Northeast Utilities (NU) and Public Service Company of New Hampshire (PSNH). (1991)

- Technical advisor for the review of financial management and involvement of United Illuminating and Northeast Utilities in the Seabrook Nuclear project in the retrospective audit of the project for the Connecticut DPUC. (1987)

- Directed a review of the financial functions of General Public Utilities (GPU) and its five subsidiaries as part of a system-wide "Expenditure Analysis Program." Reviewed cost allocation methods used by GPU to account for transactions among its five subsidiaries. Study resulted in the reorganizing and downsizing of the financial functions and a streamlining of management reports. (1989)

- Co-director of a study mission of utility executives that visited the United Kingdom to assess the privatization and deregulation of the electric utility industry in Great Britain. (1991)

Regulatory Audit Experience

Project Director for the following commission-mandated management reviews:

- United Illuminating – Comprehensive (2002)
- Pacific Gas & Electric - Financial Condition -- California PUC (2001)
- California Electric Utilities - PX Prices -- California PUC (2000)
- Philadelphia Gas Works -- PA PUC (2001)

- Southern Connecticut Gas - Affiliate Relations -- CT DPUC (2000)
- Connecticut Light & Power - Financial Condition -- CT DPUC (1998)
- Maine Yankee Atomic Power -- Maine PUC (1997)
- Northeast Utilities - Nuclear Operations -- CT DPUC (1997)
- Connecticut Light & Power - Diagnostic Audit -- CT DPUC (1996)
- Pacific Gas & Electric - DSM -- California PUC (1994)
- Los Angeles Department of Water and Power -- LA City Council (1994)
- Southern California Edison - RD&D -- California PUC (1993)
- Maryland Natural Gas -- Maryland PSC (1990)
- Consolidated Edison Company -- New York PSC (1988)
- Apollo/Carnegie Gas Companies -- Pennsylvania PUC (1988)
- General Public Utilities -- Pennsylvania PUC (1980)
- Northeast Utilities - Gas Properties -- CT DPUC (1981)
- Central Hudson Gas & Electric -- New York PSC (1980)
- New York State Electric & Gas -- New York PSC (1979)
- Pennsylvania Gas & Water -- Pennsylvania PUC (1978)
- United Illuminating --CT DPUC (1977)
- Salem Nuclear Project -- Public Advocate of New Jersey (1977)
- Nine Mile Two Prospective -- New York PSC (1981)
- Seabrook Phase I -- CT DPUC (1987)
- New York Tel/Construction Program Planning -- New York PSC (1986)

Expert Witness Experience

Mr. Wheaton has appeared as an expert witness with respect to the following audits:

- Southern Connecticut Gas -- CT DPUC (2001)
- Pacific Gas & Electric -- California PUC (2001)
- Maine Yankee Atomic Power - Maine PUC (1997)
- General Public Utilities - PA PUC and US Congressional Subcommittee (1980)
- New York State Electric & Gas - New York PSC (1979)
- United Illuminating - CT DPUC (1977)
- Salem Nuclear Project - NJ BPU and PA PUC (1977)
- Nine Mile Two Prospective - New York PSC (1981)

Work Experience

- Managing Director and Founder, Barrington-Wellesley Group, Inc. (1990 - present)

- Vice President and Board Member, Theodore Barry & Associates. (1976 - 1981, 1985 - 1990)

- Senior Vice President, Putnam Investor Services, Inc. Responsible for information resource management activities. (1982 - 1985)

- Manager, Management Consulting. Coopers & Lybrand. (1964 – 1976)

EXHIBIT 2

Rate Schedule 300 (E-32)
Scope: 192 Customers

Class Averages

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	31	0.9%	56.4%
$80-160	52	1.4%	55.5%
$40-80	83	2.3%	54.1%
$20-40	232	6.4%	51.8%
$10-20	551	15.2%	45.4%
$0-10	1098	30.2%	30.2%
=$0	1003	27.6%	
$0 to -10	325	9.0%	9.0%
-$10 to -20	75	2.1%	11.0%
-$20 to -40	40	1.1%	12.1%
-$40 to -80	72	2.0%	14.1%
-$80 to -160	34	0.9%	15.0%
<-$160	34	0.9%	16.0%
	3630	100.0%	
+/- $10	66.8%		
+/- $20	84.1%		
+/- $40	91.6%		
+/- $80	95.8%		
+/- $160	98.2%		

Customer Specific Load Factor

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	7	0.4%	39.4%
$80-160	12	0.7%	39.0%
$40-80	24	1.5%	38.2%
$20-40	41	2.6%	36.7%
$10-20	53	3.3%	34.2%
$0-10	495	30.9%	30.9%
=$0	347	21.6%	
$0 to -10	490	30.6%	30.6%
-$10 to -20	72	4.5%	35.1%
-$20 to -40	31	1.9%	37.0%
-$40 to -80	14	0.9%	37.9%
-$80 to -160	10	0.6%	38.5%
<-$160	7	0.4%	38.9%
	1603	100.0%	
+/- $10	83.1%		
+/- $20	90.9%		
+/- $40	95.4%		
+/- $80	97.8%		
+/- $160	99.1%		

KW History - Previous Month

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	10	0.3%	27.4%
$80-160	16	0.5%	27.1%
$40-80	32	0.9%	26.7%
$20-40	67	1.9%	25.8%
$10-20	101	2.9%	23.9%
$0-10	736	21.0%	21.0%
=$0	1603	45.7%	
$0 to -10	730	20.8%	20.8%
-$10 to -20	96	2.7%	23.5%
-$20 to -40	67	1.9%	25.5%
-$40 to -80	32	0.9%	26.4%
-$80 to -160	12	0.3%	26.7%
<-$160	6	0.2%	26.9%
	3508	100.0%	
+/- $10	87.5%		
+/- $20	93.1%		
+/- $40	96.9%		
+/- $80	98.7%		
+/- $160	99.5%		

KW History - Same Month Prior Year

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	9	0.5%	34.3%
$80-160	13	0.8%	33.7%
$40-80	24	1.5%	32.9%
$20-40	39	2.4%	31.5%
$10-20	65	4.0%	29.1%
$0-10	412	25.1%	25.1%
=$0	648	39.5%	
$0 to -10	347	21.2%	21.2%
-$10 to -20	44	2.7%	23.9%
-$20 to -40	18	1.1%	25.0%
-$40 to -80	5	0.3%	25.3%
-$80 to -160	10	0.6%	25.9%
<-$160	5	0.3%	26.2%
	1639	100.0%	
+/- $10	85.8%		
+/- $20	92.5%		
+/- $40	96.0%		
+/- $80	97.7%		
+/- $160	99.1%		

Rate Schedule 300 (E-32)
Scope 103 Customers

Class Averages

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	73.3%
80 to 100%	455	12.5%	73.3%
60 to 80%	601	16.6%	60.7%
40 to 60%	696	19.2%	44.2%
20 to 40%	523	14.4%	25.0%
0 to 20%	383	10.6%	10.6%
=0%	246	6.8%	
0 to -20%	261	7.2%	7.2%
-20 to -40%	200	5.5%	12.7%
-40 to -60%	152	4.2%	16.9%
-60 to -80%	44	1.2%	18.1%
-80 to -100%	43	1.2%	19.3%
<-100%	24	0.7%	20.0%
	3628	100.0%	

Customer Specific Load Factor

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	52.0%
80 to 100%	12	0.8%	52.0%
60 to 80%	14	0.9%	51.2%
40 to 60%	57	3.6%	50.3%
20 to 40%	193	12.1%	46.8%
0 to 20%	555	34.7%	34.7%
=0%	3	0.2%	
0 to -20%	481	30.1%	30.1%
-20 to -40%	157	9.8%	39.9%
-40 to -60%	53	3.3%	43.2%
-60 to -80%	21	1.3%	44.5%
-80 to -100%	15	0.9%	45.5%
<-100%	38	2.4%	47.8%
	1599	100.0%	

KW History - Previous Month

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	31.7%
80 to 100%	24	0.7%	31.7%
60 to 80%	28	0.8%	31.0%
40 to 60%	90	2.6%	30.2%
20 to 40%	221	6.4%	27.6%
0 to 20%	738	21.2%	21.2%
=0%	1312	37.8%	
0 to -20%	681	19.6%	19.6%
-20 to -40%	185	5.3%	24.9%
-40 to -60%	71	2.0%	27.0%
-60 to -80%	34	1.0%	28.0%
-80 to -100%	45	1.3%	29.3%
<-100%	44	1.3%	30.5%
	3473	100.0%	

KW History - Same Month Prior Year

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	41.1%
80 to 100%	25	1.5%	41.1%
60 to 80%	16	1.0%	39.5%
40 to 60%	76	4.7%	38.6%
20 to 40%	152	9.4%	33.8%
0 to 20%	395	24.4%	24.4%
=0%	449	27.8%	
0 to -20%	301	18.6%	18.6%
-20 to -40%	82	5.1%	23.7%
-40 to -60%	46	2.8%	26.5%
-60 to -80%	22	1.4%	27.9%
-80 to -100%	21	1.3%	29.2%
<-100%	31	1.9%	31.1%
	1616	100.0%	

Rate Schedule 300 (E-32)
Scope 193 Customers

Class Averages

KW Diff	No. of Entries	% of Entries	Cumulative
>32	131	3.6%	73.2%
16 - 32	143	3.9%	69.6%
8 - 16	470	12.9%	65.7%
4 - 8	735	20.2%	52.7%
2 - 4	558	15.4%	32.5%
0 - 2	621	17.1%	17.1%
=0	246	6.8%	
0 to -2	332	9.1%	9.1%
-2 to -4	100	2.8%	11.9%
-4 to -8	76	2.1%	14.0%
-8 to -16	56	1.5%	15.5%
-16 to -32	49	1.3%	16.9%
<-32	113	3.1%	20.0%
	3630	100%	

+/- 2 kW	33.0%
+/- 4 kW	51.2%
+/- 8 kW	73.5%
+/- 16 kW	88.0%
+/- 32 kW	93.3%

Customer Specific Load Factor

KW Diff	No. of Entries	% of Entries	Cumulative
>32	33	2.1%	51.8%
16 - 32	32	2.0%	49.8%
8 - 16	49	3.1%	47.8%
4 - 8	102	6.4%	44.7%
2 - 4	127	7.9%	38.4%
0 - 2	488	30.4%	30.4%
=0	3	0.2%	
0 to -2	435	27.1%	27.1%
-2 to -4	129	8.0%	35.2%
-4 to -8	102	6.4%	41.5%
-8 to -16	53	3.3%	44.9%
-16 to -32	28	1.7%	46.6%
<-32	22	1.4%	48.0%
	1603	100.0%	

+/- 2 kW	57.8%
+/- 4 kW	73.7%
+/- 8 kW	86.5%
+/- 16 kW	92.8%
+/- 32 kW	96.6%

KW History - Previous Month

KW Diff	No. of Entries	% of Entries	Cumulative
>32	42	1.2%	31.5%
16 - 32	47	1.3%	30.3%
8 - 16	88	2.5%	29.0%
4 - 8	132	3.8%	26.5%
2 - 4	170	4.9%	22.7%
0 - 2	621	17.8%	17.8%
=0	1313	37.6%	
0 to -2	627	18.0%	18.0%
-2 to -4	153	4.4%	22.4%
-4 to -8	135	3.9%	26.2%
-8 to -16	78	2.2%	28.5%
-16 to -32	52	1.5%	30.0%
<-32	30	0.9%	30.8%
	3488	100.0%	

+/- 2 kW	73.4%
+/- 4 kW	82.7%
+/- 8 kW	90.3%
+/- 16 kW	95.1%
+/- 32 kW	97.9%

KW History - Same Month Prior Year

KW Diff	No. of Entries	% of Entries	Cumulative
>32	33	2.0%	40.5%
16 - 32	36	2.2%	38.5%
8 - 16	43	2.6%	36.3%
4 - 8	103	6.3%	33.7%
2 - 4	99	6.0%	27.4%
0 - 2	350	21.4%	21.4%
=0	468	28.6%	
0 to -2	306	18.7%	18.7%
-2 to -4	91	5.6%	24.2%
-4 to -8	50	3.1%	27.3%
-8 to -16	28	1.7%	29.0%
-16 to -32	14	0.9%	29.9%
<-32	17	1.0%	30.9%
	1638	100.0%	

+/- 2 kW	68.6%
+/- 4 kW	80.2%
+/- 8 kW	89.6%
+/- 16 kW	93.9%
+/- 32 kW	96.9%

Rate Schedule 160 (EC-1)
Scope: 54 Customers

PLW-2

Class Averages

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	0	0.0%	66.7%
$80-160	3	0.2%	66.7%
$40-80	38	3.0%	66.5%
$20-40	264	21.0%	63.4%
$10-20	275	21.9%	42.4%
$0-10	257	20.5%	20.5%
=$0	20	1.6%	
$0 to -10	163	13.0%	13.0%
-$10 to -20	97	7.7%	20.7%
-$20 to -40	102	8.1%	28.8%
-$40 to -80	31	2.5%	31.3%
-$80 to -160	5	0.4%	31.7%
<-$160	0	0.0%	31.7%
	1255	100.0%	

$ Diff			
+/- $10	35.1%		
+/- $20	64.7%		
+/- $40	93.9%		
+/- $80	99.4%		
+/- $160	100.0%		

Seasonal Class Averages

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	0	0.0%	47.8%
$80-160	3	0.2%	47.8%
$40-80	42	3.3%	47.6%
$20-40	208	16.6%	44.2%
$10-20	165	13.1%	27.6%
$0-10	182	14.5%	14.5%
=$0	20	1.6%	
$0 to -10	173	13.8%	13.8%
-$10 to -20	125	10.0%	23.7%
-$20 to -40	138	11.0%	34.7%
-$40 to -80	127	10.1%	44.9%
-$80 to -160	68	5.4%	50.3%
<-$160	4	0.3%	50.6%
	1255	100.0%	

$ Diff			
+/- $10	29.9%		
+/- $20	53.0%		
+/- $40	80.6%		
+/- $80	94.0%		
+/- $160	99.7%		

Customer Specific Load Factor

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	0	0.0%	51.5%
$80-160	1	0.2%	51.5%
$40-80	6	1.0%	51.4%
$20-40	42	6.7%	50.4%
$10-20	111	17.8%	43.7%
$0-10	162	25.9%	25.9%
=$0	1	0.2%	
$0 to -10	161	25.8%	25.8%
-$10 to -20	86	13.8%	39.5%
-$20 to -40	46	7.4%	46.9%
-$40 to -80	9	1.4%	48.3%
-$80 to -160	0	0.0%	48.3%
<-$160	0	0.0%	48.3%
	625	100.0%	

$ Diff			
+/- $10	51.8%		
+/- $20	83.4%		
+/- $40	97.4%		
+/- $80	99.8%		
+/- $160	100.0%		

KW History - Previous Month

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	0	0.0%	46.3%
$80-160	2	0.2%	46.3%
$40-80	16	1.3%	46.1%
$20-40	85	7.0%	44.8%
$10-20	108	8.9%	37.8%
$0-10	351	28.9%	28.9%
=$0	78	6.4%	
$0 to -10	368	30.3%	30.3%
-$10 to -20	129	10.6%	40.9%
-$20 to -40	66	5.4%	46.3%
-$40 to -80	12	1.0%	47.3%
-$80 to -160	0	0.0%	47.3%
<-$160	0	0.0%	47.3%
	1215	100.0%	

$ Diff			
+/- $10	65.6%		
+/- $20	85.1%		
+/- $40	97.5%		
+/- $80	99.8%		
+/- $160	100.0%		

KW History - Same Month Prior Year

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	0	0.0%	53.8%
$80-160	2	0.3%	53.8%
$40-80	16	2.5%	53.5%
$20-40	57	9.0%	50.9%
$10-20	77	12.2%	41.9%
$0-10	188	29.7%	29.7%
=$0	24	3.8%	
$0 to -10	169	26.7%	26.7%
-$10 to -20	58	9.2%	35.9%
-$20 to -40	29	4.6%	40.5%
-$40 to -80	11	1.7%	42.2%
-$80 to -160	1	0.2%	42.4%
<-$160	0	0.0%	42.4%
	632	100.0%	

$ Diff			
+/- $10	60.3%		
+/- $20	81.6%		
+/- $40	95.3%		
+/- $80	99.5%		
+/- $160	100.0%		

Rate Schedule 160 (EC 1)
Scope: 51 Customers

Class Averages

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	64.8%
80 to 100%	6	0.5%	64.8%
60 to 80%	52	4.0%	64.4%
40 to 60%	202	15.6%	60.3%
20 to 40%	289	22.4%	44.7%
0 to 20%	288	22.3%	22.3%
=0%	19	1.5%	
0 to -20%	189	14.6%	14.6%
-20 to -40%	121	9.4%	24.0%
-40 to -60%	56	4.3%	28.4%
-60 to -80%	21	1.6%	30.0%
-80 to -100%	2	0.2%	30.1%
<-100%	46	3.6%	33.7%
	1291	100.0%	

Seasonal Class Averages

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	66.2%
80 to 100%	3	0.2%	66.2%
60 to 80%	44	3.5%	66.0%
40 to 60%	173	13.9%	62.4%
20 to 40%	287	23.0%	48.6%
0 to 20%	320	25.6%	25.6%
=0%	25	2.0%	
0 to -20%	222	17.8%	17.8%
-20 to -40%	108	8.6%	26.4%
-40 to -60%	43	3.4%	29.9%
-60 to -80%	18	1.4%	31.3%
-80 to -100%	5	0.4%	31.7%
<-100%	1	0.1%	31.8%
	1249	100.0%	

Customer Specific Load Factor

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	51.7%
80 to 100%	0	0.0%	51.7%
60 to 80%	3	0.5%	51.7%
40 to 60%	19	3.0%	51.2%
20 to 40%	99	15.9%	48.2%
0 to 20%	201	32.3%	32.3%
=0%	0	0.0%	
0 to -20%	183	29.4%	29.4%
-20 to -40%	86	13.8%	43.2%
-40 to -60%	20	3.2%	46.4%
-60 to -80%	10	1.6%	48.0%
-80 to -100%	2	0.3%	48.3%
<-100%	0	0.0%	48.3%
	623	100.0%	

KW History - Previous Month

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	46.5%
80 to 100%	1	0.1%	46.5%
60 to 80%	8	0.7%	46.4%
40 to 60%	23	1.9%	45.7%
20 to 40%	122	10.1%	43.8%
0 to 20%	408	33.7%	33.7%
=0%	74	6.1%	
0 to -20%	390	32.3%	32.3%
-20 to -40%	122	10.1%	42.3%
-40 to -60%	31	2.6%	44.9%
-60 to -80%	12	1.0%	45.9%
-80 to -100%	4	0.3%	46.2%
<-100%	14	1.2%	47.4%
	1209	100.0%	

KW History - Same Month Prior Year

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	54.3%
80 to 100%	0	0.0%	54.3%
60 to 80%	5	0.8%	54.3%
40 to 60%	25	4.0%	53.5%
20 to 40%	83	13.3%	49.5%
0 to 20%	227	36.3%	36.3%
=0%	24	3.8%	
0 to -20%	182	29.1%	29.1%
-20 to -40%	52	8.3%	37.4%
-40 to -60%	18	2.9%	40.3%
-60 to -80%	6	1.0%	41.2%
-80 to -100%	0	0.0%	41.2%
<-100%	4	0.6%	41.9%
	626	100.0%	

Rate Schedule 160 (EC-1)
Scope 54 Customers

Class Averages

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	66.7%
16 - 32	0	0.0%	66.7%
8 - 16	4	0.3%	66.7%
4 - 8	102	8.1%	66.4%
2 - 4	306	24.4%	58.2%
0 - 2	425	33.9%	33.9%
=0	20	1.6%	
0 to -2	254	20.2%	20.2%
-2 to -4	107	8.5%	28.8%
-4 to -8	32	2.5%	31.3%
-8 to -16	5	0.4%	31.7%
-16 to -32	0	0.0%	31.7%
<-32	0	0.0%	31.7%
	1255	100.0%	

+/- 2 kW	55.7%
+/- 4 kW	88.6%
+/- 8 kW	99.3%
+/- 16 kW	100.0%
+/- 32 kW	100.0%

Seasonal Class Averages

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	65.9%
16 - 32	0	0.0%	65.9%
8 - 16	5	0.4%	65.9%
4 - 8	75	6.0%	65.5%
2 - 4	313	24.9%	59.5%
0 - 2	434	34.6%	34.6%
=0	26	2.1%	
0 to -2	286	22.8%	22.8%
-2 to -4	96	7.6%	30.4%
-4 to -8	18	1.4%	31.9%
-8 to -16	2	0.2%	32.0%
-16 to -32	0	0.0%	32.0%
<-32	0	0.0%	32.0%
	1255	100.0%	

+/- 2 kW	59.4%
+/- 4 kW	92.0%
+/- 8 kW	99.4%
+/- 16 kW	100.0%
+/- 32 kW	100.0%

Customer Specific Load Factor

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	51.5%
16 - 32	0	0.0%	51.5%
8 - 16	1	0.2%	51.5%
4 - 8	9	1.4%	51.4%
2 - 4	72	11.5%	49.9%
0 - 2	240	38.4%	38.4%
=0	1	0.2%	
0 to -2	230	36.8%	36.8%
-2 to -4	60	9.6%	46.4%
-4 to -8	12	1.9%	48.3%
-8 to -16	0	0.0%	48.3%
-16 to -32	0	0.0%	48.3%
<-32	0	0.0%	48.3%
	625	100%	

+/- 2 kW	75.4%
+/- 4 kW	96.5%
+/- 8 kW	99.8%
+/- 16 kW	100.0%
+/- 32 kW	100.0%

KW History - Previous Month

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	46.3%
16 - 32	0	0.0%	46.3%
8 - 16	2	0.2%	46.3%
4 - 8	28	2.3%	46.1%
2 - 4	97	8.0%	43.8%
0 - 2	435	35.8%	35.8%
=0	78	6.4%	
0 to -2	475	39.1%	39.1%
-2 to -4	80	6.6%	45.7%
-4 to -8	19	1.6%	47.2%
-8 to -16	1	0.1%	47.3%
-16 to -32	0	0.0%	47.3%
<-32	0	0.0%	47.3%
	1215	100.0%	

+/- 2 kW	81.3%
+/- 4 kW	95.9%
+/- 8 kW	99.8%
+/- 16 kW	100.0%
+/- 32 kW	100.0%

KW History - Same Month Prior Year

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	53.8%
16 - 32	0	0.0%	53.8%
8 - 16	2	0.3%	53.8%
4 - 8	27	4.3%	53.5%
2 - 4	63	10.0%	49.2%
0 - 2	248	39.2%	39.2%
=0	24	3.8%	
0 to -2	216	34.2%	34.2%
-2 to -4	40	6.3%	40.5%
-4 to -8	11	1.7%	42.2%
-8 to -16	1	0.2%	42.4%
-16 to -32	0	0.0%	42.4%
<-32	0	0.0%	42.4%
	632	100.0%	

+/- 2 kW	77.2%
+/- 4 kW	93.5%
+/- 8 kW	99.5%
+/- 16 kW	100.0%
+/- 32 kW	100.0%

Rate Schedule 1800 (ECT-1R)
Scope: 140 Customers

Class Averages

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	2	0.1%	60.6%
$80-160	12	0.4%	60.5%
$40-80	137	5.0%	60.1%
$20-40	513	18.7%	55.1%
$10-20	512	18.6%	36.4%
$0-10	488	17.8%	17.8%
=$0	35	1.3%	
$0 to -10	272	9.9%	9.9%
-$10 to -20	200	7.3%	17.2%
-$20 to -40	304	11.1%	28.2%
-$40 to -80	204	7.4%	35.7%
-$80 to -160	60	2.2%	37.9%
<-$160	8	0.3%	38.2%
	2747	100.0%	
+/- $10	28.9%		
+/- $20	54.9%		
+/- $40	84.6%		
+/- $80	97.0%		
+/- $160	99.6%		

Seasonal Class Averages

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	2	0.1%	60.7%
$80-160	17	0.6%	60.6%
$40-80	160	5.8%	60.0%
$20-40	472	17.2%	54.2%
$10-20	472	17.2%	37.0%
$0-10	545	19.8%	19.8%
=$0	54	2.0%	
$0 to -10	412	15.0%	15.0%
-$10 to -20	250	9.1%	24.1%
-$20 to -40	219	8.0%	32.1%
-$40 to -80	114	4.1%	36.2%
-$80 to -160	29	1.1%	37.3%
<-$160	1	0.0%	37.3%
	2747	100.0%	
+/- $10	36.8%		
+/- $20	63.1%		
+/- $40	88.2%		
+/- $80	98.2%		
+/- $160	99.9%		

Customer Specific Load Factor

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	0	0.0%	48.3%
$80-160	1	0.1%	48.3%
$40-80	32	2.5%	48.2%
$20-40	112	8.7%	45.7%
$10-20	170	13.3%	37.0%
$0-10	304	23.7%	23.7%
=$0	0	0.0%	
$0 to -10	296	23.1%	23.1%
-$10 to -20	150	11.7%	34.8%
-$20 to -40	148	11.5%	46.3%
-$40 to -80	63	4.9%	51.2%
-$80 to -160	5	0.4%	51.6%
<-$160	1	0.1%	51.7%
	1282	100.0%	
+/- $10	46.8%		
+/- $20	71.8%		
+/- $40	92.0%		
+/- $80	99.5%		
+/- $160	99.9%		

KW History - Previous Month

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	2	0.1%	48.2%
$80-160	9	0.3%	48.2%
$40-80	102	3.9%	47.8%
$20-40	282	10.7%	43.9%
$10-20	319	12.1%	33.2%
$0-10	555	21.1%	21.1%
=$0	100	3.8%	
$0 to -10	636	24.2%	24.2%
-$10 to -20	320	12.2%	36.3%
-$20 to -40	233	8.9%	45.2%
-$40 to -80	59	2.2%	47.4%
-$80 to -160	12	0.5%	47.9%
<-$160	2	0.1%	48.0%
	2631	100.0%	
+/- $10	49.1%		
+/- $20	73.4%		
+/- $40	92.9%		
+/- $80	99.0%		
+/- $160	99.8%		

KW History - Same Month Prior Year

$ Diff	No. of Entries	% of Entries	Cumulative
>$160	0	0.0%	51.0%
$80-160	8	0.6%	51.0%
$40-80	52	4.1%	50.4%
$20-40	122	9.5%	46.3%
$10-20	181	14.1%	36.8%
$0-10	291	22.7%	22.7%
=$0	44	3.4%	
$0 to -10	287	22.4%	22.4%
-$10 to -20	162	12.6%	35.0%
-$20 to -40	95	7.4%	42.4%
-$40 to -80	35	2.7%	45.2%
-$80 to -160	5	0.4%	45.6%
<-$160	0	0.0%	45.6%
	1282	100.0%	
+/- $10	48.5%		
+/- $20	75.3%		
+/- $40	92.2%		
+/- $80	99.0%		
+/- $160	100.0%		

Rate Schedule 1800 (ECT-1R)
Scope 1800 Customers

Class Averages

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	60.7%
80 to 100%	12	0.4%	60.7%
60 to 80%	96	3.5%	60.3%
40 to 60%	390	14.2%	56.8%
20 to 40%	614	22.4%	42.5%
0 to 20%	552	20.1%	20.1%
=0%	35	1.3%	
0 to -20%	412	15.0%	15.0%
-20 to -40%	348	12.7%	27.7%
-40 to -60%	182	6.6%	34.4%
-60 to -80%	62	2.3%	36.6%
-80 to -100%	29	1.1%	37.7%
<-100%	9	0.3%	38.0%
	2628	100.0%	

Seasonal Class Averages

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	60.9%
80 to 100%	16	0.6%	60.9%
60 to 80%	71	2.6%	60.3%
40 to 60%	310	11.3%	57.7%
20 to 40%	576	21.0%	46.4%
0 to 20%	695	25.4%	25.4%
=0%	54	2.0%	
0 to -20%	545	19.9%	19.9%
-20 to -40%	324	11.8%	31.7%
-40 to -60%	99	3.6%	35.3%
-60 to -80%	41	1.5%	36.8%
-80 to -100%	7	0.3%	37.1%
<-100%	3	0.1%	37.2%
	2741	100.0%	

Customer Specific Load Factor

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	48.3%
80 to 100%	2	0.2%	48.3%
60 to 80%	10	0.8%	48.1%
40 to 60%	48	3.7%	47.3%
20 to 40%	170	13.3%	43.6%
0 to 20%	389	30.3%	30.3%
=0%	0	0.0%	
0 to -20%	379	29.6%	29.6%
-20 to -40%	180	14.0%	43.6%
-40 to -60%	67	5.2%	48.8%
-60 to -80%	19	1.5%	50.3%
-80 to -100%	9	0.7%	51.0%
<-100%	9	0.7%	51.7%
	1282	100.0%	

KW History - Previous Month

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	48.3%
80 to 100%	4	0.2%	48.3%
60 to 80%	32	1.2%	48.1%
40 to 60%	95	3.6%	46.9%
20 to 40%	357	13.6%	43.3%
0 to 20%	781	29.7%	29.7%
=0%	97	3.7%	
0 to -20%	753	28.7%	28.7%
-20 to -40%	276	10.5%	39.2%
-40 to -60%	106	4.0%	43.2%
-60 to -80%	48	1.8%	45.0%
-80 to -100%	39	1.5%	46.5%
<-100%	40	1.5%	48.0%
	2628	100.0%	

KW History - Same Month Prior Year

KW Diff/ Billed KW, %	No. of Entries	% of Entries	Cumulative
>100%	0	0.0%	51.0%
80 to 100%	2	0.2%	51.0%
60 to 80%	21	1.6%	50.9%
40 to 60%	52	4.1%	49.2%
20 to 40%	176	13.7%	45.2%
0 to 20%	403	31.4%	31.4%
=0%	44	3.4%	
0 to -20%	357	27.8%	27.8%
-20 to -40%	137	10.7%	38.5%
-40 to -60%	53	4.1%	42.7%
-60 to -80%	19	1.5%	44.1%
-80 to -100%	7	0.5%	44.7%
<-100%	11	0.9%	45.6%
	1282	100.0%	

Rate Schedule 1800 (ECT 1R)
Scope: 140 Customers

Class Averages

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	60.6%
16 - 32	2	0.1%	60.6%
8 - 16	17	0.6%	60.5%
4 - 8	172	6.3%	59.9%
2 - 4	556	20.2%	53.6%
0 - 2	917	33.4%	33.4%
=0	35	1.3%	
0 to -2	512	18.6%	18.6%
-2 to -4	305	11.1%	29.7%
-4 to -8	174	6.3%	36.1%
-8 to -16	52	1.9%	38.0%
-16 to -32	5	0.2%	38.2%
<-32	0	0.0%	38.2%
	2747	100.0%	

+/- 2 kW	53.3%
+/- 4 kW	84.6%
+/- 8 kW	97.2%
+/- 16 kW	99.7%
+/- 32 kW	100.0%

Seasonal Class Averages

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	60.7%
16 - 32	3	0.1%	60.7%
8 - 16	13	0.5%	60.6%
4 - 8	152	5.5%	60.1%
2 - 4	499	18.2%	54.6%
0 - 2	1001	36.4%	36.4%
=0	54	2.0%	
0 to -2	678	24.7%	24.7%
-2 to -4	221	8.0%	32.7%
-4 to -8	95	3.5%	36.2%
-8 to -16	30	1.1%	37.3%
-16 to -32	1	0.0%	37.3%
<-32	0	0.0%	37.3%
	2747	100.0%	

+/- 2 kW	63.1%
+/- 4 kW	89.3%
+/- 8 kW	98.3%
+/- 16 kW	99.9%
+/- 32 kW	100.0%

Customer Specific Load Factor

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	48.3%
16 - 32	1	0.1%	48.3%
8 - 16	1	0.1%	48.2%
4 - 8	34	2.7%	48.1%
2 - 4	128	10.0%	45.5%
0 - 2	455	35.5%	35.5%
=0	0	0.0%	
0 to -2	455	35.5%	35.5%
-2 to -4	143	11.2%	46.6%
-4 to -8	59	4.6%	51.2%
-8 to -16	5	0.4%	51.6%
-16 to -32	1	0.1%	51.7%
<-32	0	0.0%	51.7%
	1282	100.0%	

+/- 2 kW	71.0%
+/- 4 kW	92.1%
+/- 8 kW	99.4%
+/- 16 kW	99.8%
+/- 32 kW	100.0%

KW History - Previous Month

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	48.2%
16 - 32	2	0.1%	48.2%
8 - 16	10	0.4%	48.2%
4 - 8	104	4.0%	47.8%
2 - 4	258	9.8%	43.8%
0 - 2	895	34.0%	34.0%
=0	100	3.8%	
0 to -2	944	35.9%	35.9%
-2 to -4	236	9.0%	44.8%
-4 to -8	68	2.6%	47.4%
-8 to -16	13	0.5%	47.9%
-16 to -32	1	0.0%	48.0%
<-32	0	0.0%	48.0%
	2631	100.0%	

+/- 2 kW	73.7%
+/- 4 kW	92.5%
+/- 8 kW	99.0%
+/- 16 kW	99.9%
+/- 32 kW	100.0%

KW History - Same Month Prior Year

KW Diff	No. of Entries	% of Entries	Cumulative
>32	0	0.0%	51.0%
16 - 32	0	0.0%	51.0%
8 - 16	6	0.5%	51.0%
4 - 8	46	3.6%	50.5%
2 - 4	152	11.9%	47.0%
0 - 2	450	35.1%	35.1%
=0	44	3.4%	
0 to -2	457	35.6%	35.6%
-2 to -4	94	7.3%	43.0%
-4 to -8	28	2.2%	45.2%
-8 to -16	4	0.3%	45.5%
-16 to -32	1	0.1%	45.6%
<-32	0	0.0%	45.6%
	1282	100.0%	

+/- 2 kW	74.2%
+/- 4 kW	93.4%
+/- 8 kW	99.1%
+/- 16 kW	99.9%
+/- 32 kW	100.0%